approach

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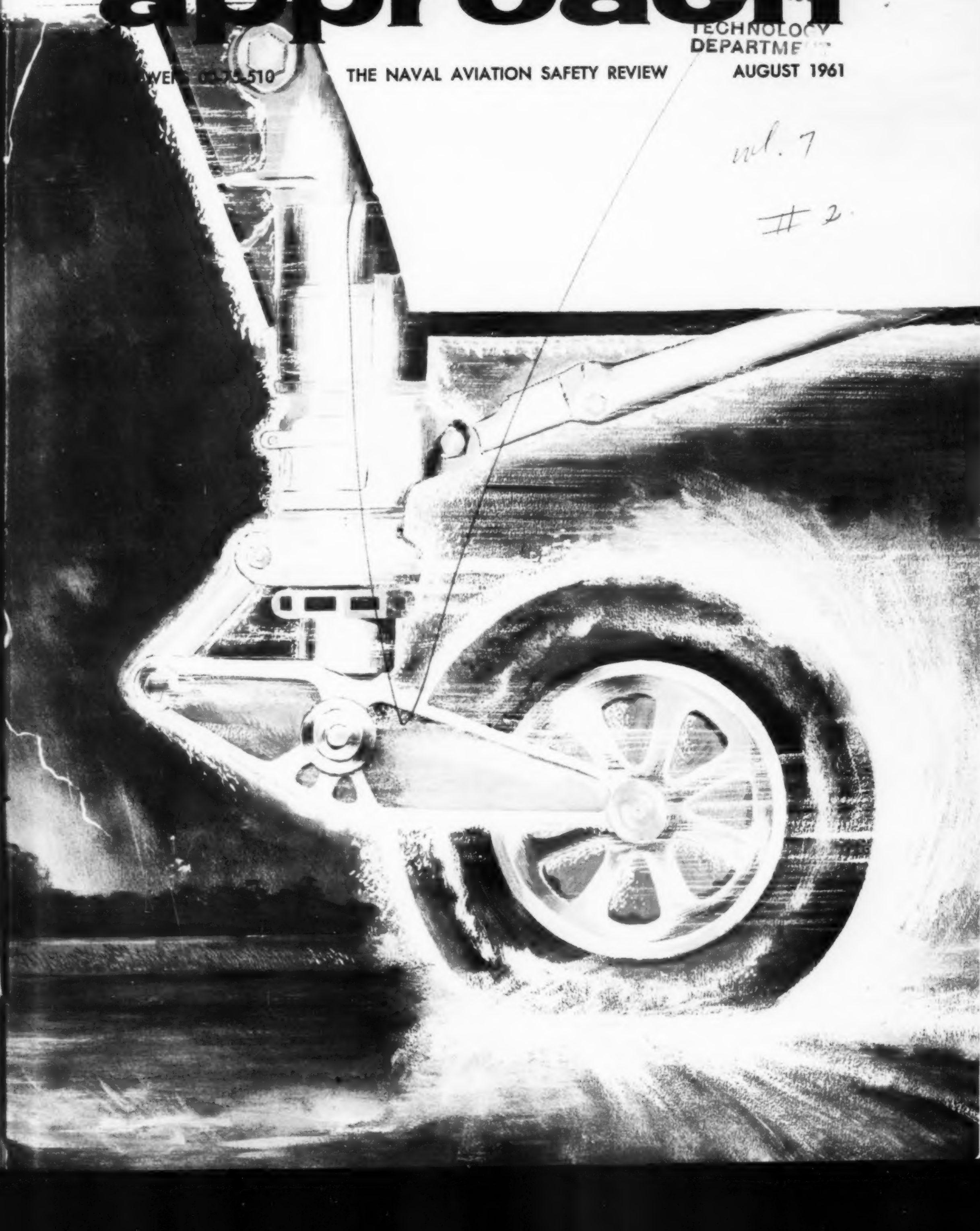
vol. 7

#2

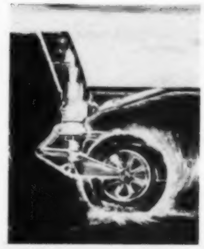


Our Product is safety, our process is education, and our profit is measured in the preservation of lives and equipment.

approach

AUGUST 1961

VOLUME 7 NUMBER 2



COVER ART BY R. B. TROTTER

CONTENTS

DEPARTMENTS

LIFT and DRAG

These fine words about aviation safety are valuable to us all and come from Major General Robert W. Burns, United States Air Force:

Like success, flying safety is a journey—not a destination. Aircraft accidents are prevented by moving, dynamic functions of flying safety—not by a set of words which define a goal or outline intent or relate a summary of statistics. Further, flying safety is a composite of many related functions—it is not a single, isolated activity.

To be effective, these functions and activities must be given specific direction and purpose. We must first identify areas of accident potential and then synchronize our collective effort into a clearly understood, working plan which strikes directly at accident causes. This plan must reflect firm, stable policy defined by precise regulations which are enforced by careful and constant supervision. This is the system of law which will govern our journey. It must contain a definite course of action which is the route of our journey. Finally, it must be compatible with and complement our mission. We can avoid accidents in direct proportion to our individual and collective efforts in carrying out this program. Its whole essence is based on our functioning together as an accident prevention team. Who are the responsible members of that team? They are the Commander, the Operations Officer, the Maintenance and Supply Officers, the Weather Officer, the Communications Officer, the Flight Safety Officer, the Doctor, the Personal Equipment Officer, the Chaplain, and most of all, the Pilot and the Airmen who, together, form the foundation of the whole accident prevention structure.

APPROACH

The Naval Aviation Safety Review
Published by U. S. Naval Aviation Safety Center

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LETTERS TO THE EDITOR

Blushing Situation

Sir:

Re: APPROACH May 1961 picture, page 49.

We were wondering if it is SOP in VMF 115 to refuel and service O_2 at the same time.

WALT KOHLER, JR., LT
Aviation Safety Officer
JAMES M. WAGGONER, PR-3

NAS Moffett

Sir:

. . . One of the rules for safety listed below the picture is as follows: Deliver the fuel to the aircraft safely and efficiently. I was wondering if this mistake was intentional or an accident? One of the main rules for safety when refueling aircraft is: Never bring an oxygen cart of any kind around aircraft while refueling. This as you probably know, could cause a very serious explosion if the two were to come in contact with each other.

J. A. MARTIN, AMS-3

Navy 3867, FPO San Francisco

● No excuses—both NASC and VMF-115 are red-faced! Douglas aircraft photogs posed the pix—see picture credits inside front cover of the same issue.

Fueling and Power Units

Sir:

Recently an aircraft was being refueled for another flight. All safety precautions were observed. However, when the refueler started to pull away from the aircraft, the NC was started up. This could have led to an explosion, but this time nothing happened. In the future, I think NC crews should wait until refuelers are well clear of aircraft before turning up the aircraft, no matter how hurried they may be.—ANYMOUSE

Free Charts Possible

Sir:

In answer to NARTU ADs and AMs. I am sure a letter addressed to any tool manufacturer will make them a recipient of the Decimal Equivalents Chart they are looking for without cost to them, or the government.

Suggested companies are Brown and Sharp, and Lufkin. I am sure there are many others.

J. J. MANION, GYSGT
VMR-252, MWSG-27,
2nd MAW

Sir:

There is no need for printing a "Decimal Equivalents Poster". They have been available for years through BuWeps.

Refer to Aeronautical Standard Drawings Index NavAer 00-25-543.

Drawing Number AND 10379. Which gives decimal equivalents to five places by 64's of an inch.

ROBERT K. WEST, AMHC
VT-24, Chase Field

Beeville, Texas

Sir:

A poster of decimal equivalents was requested by one of your readers, and you solicited other comments.

A wall chart of decimal equivalents and tap-drill sizes is certainly useful, if not essential in machine shops and to a less extent in various other mechanical enterprises. Few machinists are able to keep such material in their heads with accuracy, and the time wasted in looking up the necessary material a dozen times a day can become a serious loss, not to mention the times a reference cannot be found, or is damaged in the needed portion, so that the job is done by guess, and may not meet specifications.

Such charts used to be published by the L. S. Starrett Co. of Athol, Mass. Some of them were not organized for easy finding of information, but it was almost all there if one looked for it.

I'm not sure what NASC has to do with shop technical posters, but whoever is responsible for the preparation and distribution of a well arranged, comprehensive wall chart of decimal equivalents and all tap-drill sizes will surely earn the appreciation of a very large segment of the black-fingernail fraternity, beginning with me; thanks for thinking of us, and go to it!

(*Oilymouse*)
F. C. WARE, LT

NAS Ford Island
FPO San Francisco

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, U. S. Naval Aviation Safety Center, NAS Norfolk, Va. Views expressed are those of the writers and do not imply endorsement by the U. S. Naval Aviation Safety Center.

Barricade History

Sir:

The article on carrier barricades and barriers by LCDR R. W. Kennedy in the February 1961 issue of APPROACH was most interesting and informative.

However, I feel that LCDR Kennedy passed rather lightly by one interesting stage of evolution between the barrier with cables firmly secured to the deck and the barrier connected to the arresting gear engines.

A rather novel approach to the energy absorption problem of the barrier was in use in the year of 1940 on the old "folding stack" USS RANGER. This barrier utilized a large bronze broaching device on each end of the cables. When an aircraft engaged the barrier, the "broaching tool" attached to the deck was pulled through a bronze sleeve attached to the barrier cable and this action provided the required energy absorption.

This device was, of course, limited in capability but was generally ample for the small F3F biplanes we were then operating in *Fighting Four*. The big drawback was that the tool could "broach" completely free of the bronze bushing on the barrier cable. The heavy bushing then became much like a rock on the end of a taut line and was a lethal deck weapon. I recall an incident in which Marine 2nd Lt. Lowell Reeves engaged this type of barrier on the RANGER while flying an F3F-3 aircraft. The broaching tool separated from the sleeve, and the sleeve whipped into the aft fuselage area of the aircraft with such force that it ripped through many feet of airframe and came to rest on the pilot's back.

Fortunately, he survived but with serious injury.

And so, continued development of the barrier/barricade device was clearly indicated.

M. M. FURNEY, CDR, USN (RET.)
Boeing Airplane Company,
Wichita

Use To-From Indicator

Sir:

Being an Inactive Naval Reserve Aviator, and an Active Airline pilot, I find your magazine very useful and informative. My personal copy reaches at least 10 other readers.

In the May issue I found an error that uncorrected, I feel, could cause someone grief some day when flying under instrument conditions.

On page 36 and 37, article from The Sky Hook under TACAN Experiences, and I rewrite verbatim, "Always use the Course Line Indicator as the *only* true indication of station passage."

This is in error. When using any VOR (TACAN included) the only true indication of station passage is the TO-FROM indicator. The Course Line Indicator can be used as an additional check, as stated in the TACAN article published in the same issue on page 25.

THOMAS J. HARKINS

12 Sage Court
Huntington, N. Y.

● **Oops!**

Tacan in the A4D

Sir:

In your article "Incidents, Tacan and Vortac" (May issue) an unqualified statement was made which gave the "only" true indication of Tacan station passage: that of using the Course Line Indicator.

This perhaps is all well and good *if* your aircraft happens to have that handy little gadget known as the ID-249. But alas, there are many front-line aircraft minus that piece of gear, such as the A4D. Therefore according to the article an A4D pilot will be unable to get a true indication of station passage. How then does he know when he's over the Tacan facility?

A tried and proven method of determining station passage for those who lack the Course Line Indicator is when the ID-310 (DME) reaches its minimum distance indication, i.e., in relation to the approximate slant range, and hesitates prior to increasing again. This, combined with the ETA gives a most accurate indication of the long-sought-for station passage.

FLOYD E. SYKES, LT
VA-44 Instrument Instructor
JAX

● **You are so right!**

Point-to-Point Navigation

Sir:

As an instrument flight instructor in this squadron's IFTD I was vitally interested in Major Adams' article on Tacan in the May issue of APPROACH and thought it to be an excellent primer on Tacan navigation. I do feel however, Major Adams neglected completely the one capability of Tacan that should be of considerable interest to Navy pilots, to wit: Point-to-Point Navigation!

This letter is not the place for an article on the subject, but I would like to recommend that Major Adams, with his intimate knowledge of the subject as evidenced by his article, write a follow-up on Tacan Point-to-Point navigation. The thorough understanding of how to use this capability, quickly and simply, by utilizing the RMI Tacan Needle, should be a *must* for all Navy pilots.

A. B. WILSON, LCDR
Instrument Standardization Office, VA-126
NAS Miramar

A4D Canopy Marking

Sir:

On page 20 June 1961 APPROACH, you mentioned difficulty with the alignment marks for the A4D canopy security check from the deck. If the alignment marks were painted on the forward part of the canopy and the aft portion of the wind screen on both sides of the aircraft and the inside and outside of the canopy this would eliminate the error from the deck and also provide the pilot with a quick visual check of the canopy from the inside of the cockpit.

I look forward to your fine magazine each month and read all from cover to cover. The magazine is used by the engine phase of the Aviation Maintenance Officers school to illustrate the problems occurring in the fleet. Your June issue article FOD, on pages 44 and 45 is going to be used by us. Your magazine aids us in keeping the material current. A fine magazine and a well done to you and your staff.

GEORGE HALISCAK, GY SGT,
AMO School, NATTC
Memphis, Tenn.

Now Hear This

Sir:

Re your article (May, Miss Bristow) on hearing loss from airplane noise:

A M E N !

GROUNDEDMOUSE

For Destroyer Rescue Reprints

Sir:

The article on personnel rescue problems appearing in the June 1961 issue of APPROACH was excellent. While it cannot encompass all eventualities connected with rescue problems, it should, at least, stimulate some interesting theoretical discussions in destroyer wardrooms. There is every reason to believe many practical solutions may develop from the discussions.

This activity recommends that a reprint of subject article be made available to all destroyers.

H. P. DOWELL
O-in-C, Navy Recruiting Station
Richmond, Va.

● **Reprints coming up!**

Conditioning

Sir:

I have just finished reading "Chute and Lines and KELP" (Feb. 61). In the last paragraph the flight surgeon recommends that the experience of extricating oneself from nylon parachute lines in the water be added to the training course. I think this would be fine because there are very few things in which you can be overtrained. But how about adding the possibility your mae west is defective or your immersion suit has a leak and fills with water, or maybe add a broken wrist or leg to the problem?

My point is this. Training, using specific equipment and procedures,

is absolutely necessary but we can never cover all the existing possibilities. How about Conditioning Training? Remember the rugged life back in preflight where everyone had to demonstrate physical dexterity or you were out—or at least put back a few weeks? If flying personnel were required to *maintain* most of that physical dexterity I think it would go a long way toward solving many survival problems. This would not require an elaborate obstacle course, although that would be fine. Every air station should have a gymnasium of sorts and a few items such as ropes, parallel bars, rowing machines. . . . These could be used to provide the physical training to maintain the conditioning necessary for survival.

Most carriers now have an exercise room used mostly by the body-beautiful builders. The addition of a few other items such as mentioned above could give highly desirable results. Lastly, this program must not be voluntary for the obvious reason that those that need this training most are the least likely to volunteer.

BILL BARRON, LCDR

Tacron 22, ASO '57

● **Your suggestion for Conditioning Training has much merit and should be given due consideration by all pilots. We agree that facilities should be provided and used and that those who need it most are the least likely to use them. However, a compulsory training program can be instituted by the commanding officer.**

The Wheel Watch Works at Miramar

Sir:

. . . NAS Miramar has instituted other procedures regarding the "Wheels Watch" which may be of interest.

As a result of a Wheel-Up landing about 8 or 9 months ago it was noted that the Wheels Watch duties were being performed by personnel that could be spared from other duties. For example messcooks, compartment cleaners, etc. and the Wheels Watch was another distasteful type of duty. When a Save was made the general attitude was "he is only doing his job."

The CO graded this watch to the rightful position as a vital function to the Safety of the Fleet Operations at Miramar.

The Watch was given a shot in the arm.

● The Wheels Watch is now composed of rated personnel, third class or above. The various squadrons under CFAD contribute personnel to stand the watch.

● The period of TAD for the watch is one month.

● Briefings are held prior to posting the watch on the importance of this duty.

When a Wheels Save is made, it is confirmed by personal interview with the pilot and by the tower recordings. When confirmed the person making the save is relieved of his Watch and he is returned to his activity for other duty. The C. O. personally presents him with the NAS Miramar Wheels Save Cup lettered with all the information in Gold (this cup is made at the Station ceramic shop) and he is given a letter of appreciation for a job well done. In addition, this presentation is covered by the station paper, The Jet Journal.

The other Wheel Watch personnel try for wheels saves because they are now just more than watch standers. We are getting a few more unnecessary waveoff's because of landing lights and gear lights at night but these men are preventing Wheels-Up landings every month.

It works at MIRAMAR!

LCDR CARL SEWARD
Aviation Safety Officer

Wheels-Up Saves

McKenzie, Nathaniel, SA and Kreps, Frederick W., AC1, 10 April 1961:

The pilot of the FJ-4, being distracted in the break, failed to put his landing gear down. At the 180 he checked his indicator and reported "All down and locked." Since there was no barber pole, he failed to notice the indicator showed all wheels-up. While he was turning on final, Kreps in the tower and McKenzie on the wheel watch signaled simultaneously The pilot took the waveoff and returned for a normal landing.

JOHN T. LOWE, JR.
C. O. NAS Glynco

Brunswick, Ga.

Sir:

A recent incident which occurred here is worthy of note since it once again points out that alertness and vigilance on the part of the tower operator pays off.

At about 1440R on 8 March 1961, Baker Boy 478, an AD out of NAS Jacksonville, was making an approach to runway 27 at NAS Sanford. As the aircraft turned on final, Jones, P. F., AC2P1 visually checked for wheels. Due to the drop tanks on the aircraft it was difficult to positively determine if the AD

Eugene O'Dell, AE2, receives award and commendation from CAPT B. L. Bailey, CO of NAS Miramar.

had gear down or not. Jones quickly conferred with the wheels watch, Strickland, C. E., AM2, who concurred that the aircraft did not have the gear down. Jones then issued an emergency wave-off when the aircraft was approximately 100 feet off the deck, at which time, the aircraft pulled up and went around. The next approach was with gear down, culminating with a safe and normal landing.

As space permits in APPROACH it is requested that this report be included. Relatively, this incident may appear to be minor in nature, but, it is felt that the recognition of personnel who have demonstrated their watchful attention to duty will act as a stimulus and inducement for all Tower and Wheels Watch personnel to maintain a high degree of surveillance and attention to duty.

J. G. KENNEDY
Aviation Safety Officer

NAS, Sanford, Fla.

Code of Conduct

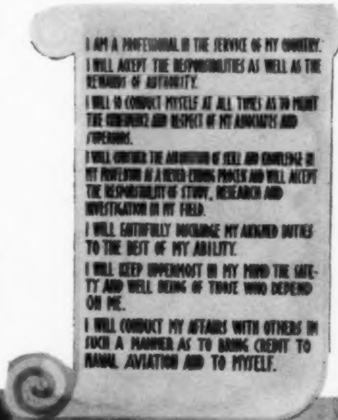
Sir:

The "Chisai RATCC," as we are referred to in the Far East, celebrates its 10th anniversary in Japan with CAPT Masterson, C. O. NAS Atsugi and COL Shuman, C. O. MAG-11 as honored guests at our birthday party.

GCA 26 is a part of the Kanto Plains High Density Traffic Complex operated by the FPS-8 equipped Yokota RAPCON. This unit continually posts a monthly traffic total which exceeds the workload of some RATCC installations. Our men are proud of their ability to provide this level of service utilizing only the equipment and complement of a standard GCA unit.

We of GCA Unit 26 felt that our use of the "Code of Conduct for Professionals" set forth by Commander Rose, in your January 1960 issue, might be of interest.

J. T. CLEGHORN, LCDR



I AM A PROFESSIONAL IN THE SERVICE OF MY COUNTRY.

I WILL ACCEPT THE RESPONSIBILITIES AS WELL AS THE REWARDS OF AUTHORITY.

I WILL SO CONDUCT MYSELF AT ALL TIMES AS TO MERIT THE CONFIDENCE AND RESPECT OF MY ASSOCIATES AND SUPERIORS.

I WILL CONSIDER THE ACQUISITION OF SKILL AND KNOWLEDGE IN MY PROFESSION AS A NEVER-ENDING PROCESS AND WILL ACCEPT THE RESPONSIBILITY OF STUDY, RESEARCH AND INVESTIGATION IN MY FIELD.

I WILL FAITHFULLY DISCHARGE MY ASSIGNED DUTIES TO THE BEST OF MY ABILITY.

I WILL KEEP UPPERMOST IN MY MIND THE SAFETY AND WELL BEING OF THOSE WHO DEPEND ON ME.

I WILL CONDUCT MY AFFAIRS WITH OTHERS IN SUCH A MANNER AS TO BRING CREDIT TO NAVAL AVIATION AND TO MYSELF.

CAPT Masterson cuts cake celebrating Chisai RATCC's 10th anniversary. COL Shuman and LCDR Cleghorn look on.

For Chopper Formation

Sirs:

The obvious answer is that helicopters and helicopter pilots need to practice and fly in formation for precisely the same reasons that other naval aircraft do.

Helicopters are not immune to loss of communications and other airborne failures where the comforting lead of a fully equipped bird would spell the difference between a "splash" and a successful recovery.

When the wheels of my HSS-2 "barber pole," I want another helicopter to take a look, not a fixed-wing whoosher. When my radio goes out I want to fly my actual CCA on the rotors of a similar type aircraft, not with full up collective and full forward cyclic, fuel gage unwinding.

When I'm a hundred miles from nowhere over the cold North Atlantic, at night, visibility decreasing, and electrical failure occurs, I want the assurance, born of practice and applied air discipline that my formation leader will bring me home.

Why fly formation in helicopters? Indeed! Why not?

F. T. LENNON, LCDR

Staff ComFAirQuonset

Preflight the Passenger Too!

Sir:

● Passengers in a transport were not briefed on use of oxygen and survival equipment prior or during flight.

● Nothing to remind them (pilots) of this obligation.

● Decided to submit Anymouse.

● Fortunately nothing happened.

● Get myself checked out as a passenger.

Strongly suggest that the preflight form for clearance have a space or two referring to: (a) type of survival equipment on board and quantity. (b) whether passengers will be briefed before or in early flight.

ANYMOUSE

● OpNav Inst 3710.7A, Sect. 8, Para. 4D states, "It is the responsibility of the pilot in command of naval aircraft to insure prior to takeoff that the crew and passengers are adequately instructed on such personal safety and survival equipment and procedures as required for the particular aircraft in which they embark."

Infrequent Instruments

WHY WAIT UNTIL YOU ARE FACED WITH ACTUAL INSTRUMENTS ON AIRWAYS TO FIND OUT WHETHER YOU ARE A VICTIM OF THE PROFICIENCY PILOT'S DISEASE . . . INFREQUENT INSTRUMENTS

TO THE proficiency pilot who struggles for his four to ten hours a month; to the "weekend-warrior" who flies his 100 hours a year, 90 of which are ASW or tactics; and to the operational pilot who takes the corridor departure to the operating area and only crosses below a civil airway, how do you feel in the copilot seat about to make your first instrument approach to Anacostia, New York, Oakland or Glenview?

You'd gladly swap seats with the pilot wouldn't you? And what about the departure? Worse isn't it? Well, what makes it so bad? Other pilots do it every day. That's it. They're familiar with it. Which is the answer. Those "other" pilots probably had it rough on *their* first attempt. So our problem is to get familiar *before* we "bust" the instrument clearance.

You've just reported for duty in the five sided palace and you need flight time for the month. Instead of meeting the guy that drives the next desk to you at Anacostia operations, meet him at Washington National Airport and make arrangements to tour the facilities that control you on an instrument clearance. Start with the tower, then departure control and while you're in that area check approach control. Try to correlate the frequencies used to the position of the operator. This will be especially important when you go over to Washington Center which is in a separate building.

At the center, follow the routing of the strips as they are made up until out of the control area. An important point here is that if the flight has the necessary frequencies, the center may control that flight direct over 200 miles south, well beyond the range of UHF or VHF radios. How? By remote control equipment. Another point; when, if you do not have the frequencies required, Center

clears you to enroute frequencies, you are still being controlled by the Center but your positions are called in to the Center by hot line from the local radio facility. So if at a fix you gave Center your position report and at that point you were cleared to enroute frequencies, there is no need of giving the local station the same report even though it is a compulsory reporting point. The only thing the local boy does with your report is log it and forward the report to Center.

Pay particular attention to the division of responsibilities by geographic sectors. Why frequencies are so important. You may see that Center has a particular frequency in the enroute supplement but it will not be assigned to you. This geographic sector division is the reason. Certain frequencies are assigned for a particular sector. Of course in emergencies they'll use anything. This is also the reason for the change in the radio procedure when calling a Center. "Washington Center this is Navy 25654, Richmond, over." This alerts the appropriate controller and causes less confusion.

While you were looking over the facilities, did you notice that the guys behind those mikes were human? After a couple of hours, you may think them more *super*-human. Yet how many times have you heard the "holier than thou" military pilot give a position report or request a clearance as though, "it's an insult to my dignity to have to talk to you, but here's my position." Try a little courtesy up there and you'd be surprised how much cooperation you can get if you need it.

You'll be amazed at how much this trip to the Center will help you in your first instrument flight into and out of a new area. There are a few more points to consider before you rush headlong into the murky sky. We mentioned familiarity as the key to coping with complicated departure and arrival procedures. The familiarity is necessary to keep ahead of the game and if there is anything that will get you behind, it is inadequate or poor planning. So along with familiarity, let's throw in planning.

First of all, you know where you want to go so the next thing is to start your "point to point" or flight planning log. Or is it? How about "preferred routing." Ever heard the term? If not you soon will, and more than likely it will be on your next instrument flight. This is the route the Center will clear you on in order to maintain orderly flow lanes in and out of congested areas—a "one way street," so to speak. If you haven't considered this, you may find yourself completing a new proposed route three minutes before takeoff and then, in the cockpit, pandemonium prevails. So ask the operations duty officer about it and if departure procedures are not printed on the DD175 or elsewhere in operations, check on this too. Now you're ready to sit down and go to work. Get familiar with the departure procedures, noting all fixes and holding points in the area. Make a note of all departure and Center frequencies you may have to use.

The planning log is next and should need no explanation, but there are a few tips that are well worth mentioning. Most important don't take the lazy way out and make it for a no wind condition unless of course there happens to be no wind. This usually indicates either pure laziness or an inability to use the E6B computer furnished with your nav kit. In either case you're in trouble.

While you're completing the log, make a notation in the left-hand margin of the chart number you're working on for that particular area. This will prevent a great deal of unnecessary shuffling of papers in the cockpit. Also, in the left-hand margin be sure to denote a non-compulsory reporting point that you may have had to use due to a large directional change in the airway. If there is a "remarks" column on the right side, as there is in the CNATra form, list the nearest airport that you could turn to in an emergency considering runway lengths and radio and navigational aids. A good practice to get into while enroute, is to turn to that facility in your book of approach charts as the flight progresses. If you are in a large multi-engine plane, have the plane captain take care of this in order to keep him occupied gainfully. It's a definite morale boost. It puts him into the act.

Now that you have all the paperwork done, weather briefing, operations clearance, and have completed the preflight, get the "office" ready for business. Have your flight planning log and DD 175 on a clipboard. Make sure you have the first two FLIP charts in the cockpit. Remove the approach plate of the facility or facilities you have chosen for a takeoff alternate and clip these to your board. You *did* consider a takeoff alternate didn't you? If not, give it some thought. It isn't necessarily going to be the airport you're departing from. For instance—a return to Anacostia in weather near minimums would be somewhat risky compared to an immediate pick-up by Andrews GCA and a vector to an 8000-foot runway just a few miles from Anacostia. Another consideration—if you are departing from a facility served by a GCA unit and the weather is near range minimums or below, *always* request a GCA track out in case you have to get back in.

While the pilot is performing his engine runup, copy down the clearance that you expect to get, leaving a few necessary blank spaces. Be sure you understand that an ATC clearance will always have a basic format. For example:

ATC clears Navy 29654 *Who* to the NHZ airport *Where*

via V123 Bal, V144 Price, Flight Planned Route *Route*

maintain 9000 feet *Altitude* Cross the 290° radial of the Herndon Omni at not above 3000 feet, contact Washington departure control immediately after takeoff on 291.6. *Special Instructions*

Enroute clearances will be the same. When you hear the familiar "Navy 29654 this is Richmond Radio, clearance, over," you should have your pencil out and as you pick up the mike write "ATC C N 654 to ______." Most of the clearances you receive during the first two-thirds of your flight will be to *climb* to a new altitude.

You have completed the departure and are now enroute. You, as copilot, have to maintain the in-flight portion of the preflight planning log. Make a "production" out of it. Fill in *all* the blanks with the possible exception of actual wind. If you log the actual ground speed this is sufficient. In the "actual wind" column, instead of wind, keep an account of the loss or gain of time for each leg. This gives you an overall picture of how you are doing in relation to your planned time enroute.

If on a long flight, a plus or minus 30 minutes comes up, call in an amendment to the Center. In addition to this, if you project the ETA next to each leg of your flight, it becomes invaluable in the case of the inevitable question from one of the passengers, "What time do we get in?" Usually this is the furthest from your mind at four hours out but in the mind of the passenger, his worst suspicions may be confirmed if you give him an answer.

The most neglected part of the planning log is the communications section. Some pilots feel that if they have to rely on a format to give a voice report it's a sign of a poor instrument pilot. Yet there are very few pilots who can give a position report without making errors in form or pausing in between words with a few ahhhhhs thrown in if they don't read it. There should be absolutely no excuse for a position report made in *any* way other than the example shown in the enroute supplement. So use the form. It not only enables you to sound as though you knew what you were doing but it serves as a record of your report and is verified when the altimeter setting of the station you reported to is logged in the remarks column.

Another service the copilot should assume is to copy weather enroute during the scheduled broadcasts. This will be invaluable if an emergency develops and an unscheduled landing has to be made enroute. Also keep the pilot advised of the destination weather and the alternate airport weather.

He should, of course, handle all radio tuning and channel selection. Anticipate the selection of radio navigation aids and be ready to switch to a new frequency immediately.

Above all—Don't just sit there!

PROJECT SCAN

System for Collecting and Analyzing Near-collision *Reports*

ALTHOUGH pilots had been aware of the problem of mid-air collisions almost since the day there were more than two aircraft in the sky, it was not until the 1957 collision of two transports over the Grand Canyon that singular recognition was given the problem on a grand scale. It was the Grand Canyon disaster which publicized the problem all pilots had known existed for some time.

Perhaps the first so-called "organization" attention to the near-collision problem occurred in 1954 at a meeting of airline chief pilots in Dallas, Texas. There the problem was discussed at great length and depth and it was agreed that a program for reporting near-collisions should be established. The Air Line Pilots Association, therefore, formally requested the Civil Aeronautics Administration to undertake such a program, but one that would assure immunity to the reporting pilots.

The Administrator of the CAA studied the ALPA request and then reported that in view of the immunity stipulation which was contrary to his agency's safety enforcement responsibilities, it would be impossible for the CAA to legally establish such a program. He suggested it was one the Civil Aeronautics Board should undertake.

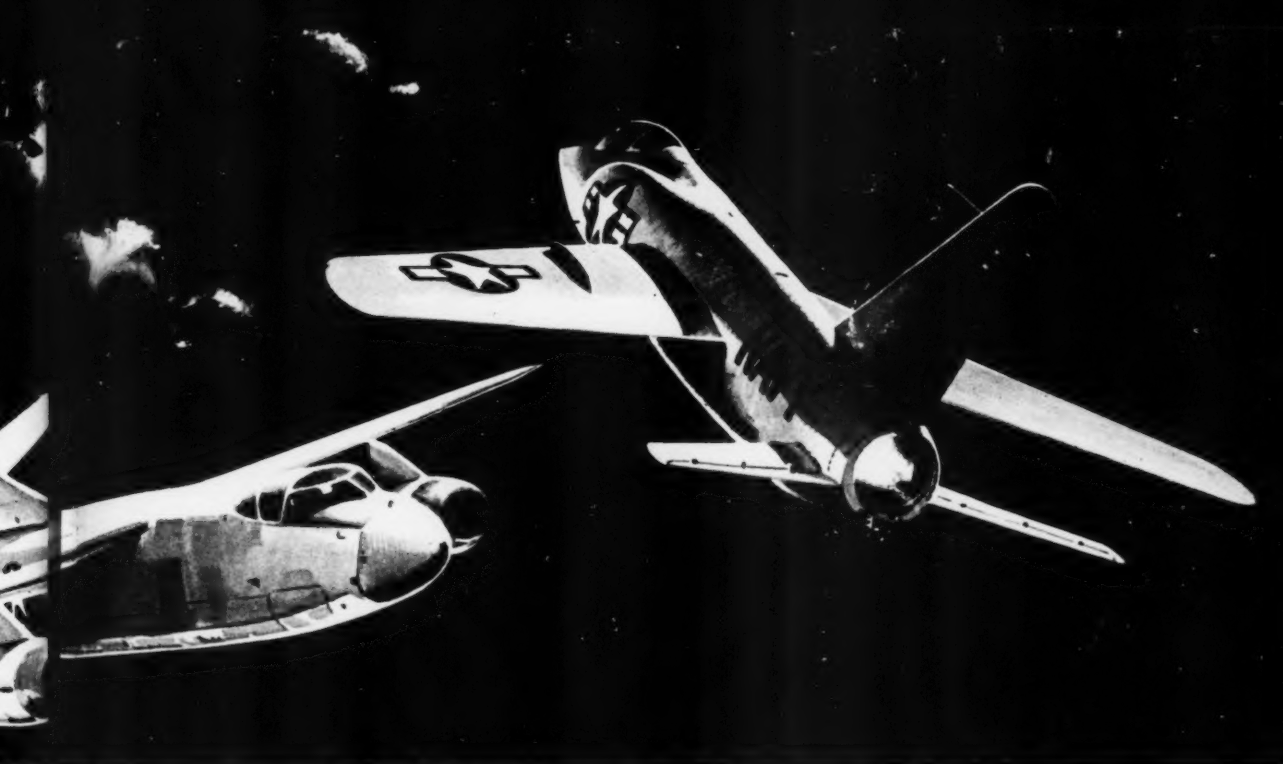
A request was directed to the CAB in 1955, and in 1956 the Civil Aeronautics Board approved a program of Voluntary Pilot Reports of Near Mid-Air Collisions. All segments of the industry, military and civil, cooperated in this program.

Meanwhile, in 1954, the Air Transport Association had begun its own independent survey of near-collision incidents, and the military, too, was conducting studies of near-collisions involving its aircraft.

Almost immediately after the CAB initiated its program of voluntary pilot reports of incidents, the reports began coming in. During the first four months of the program, 1511 reports were received and in the subsequent 15 months a total of 2833 pilot reports of near-collision incidents within the continental limits of the U.S. were received and processed.

The CAB began issuing statistical reports to the public on a quarterly basis in March, 1957, its final report appearing in May, 1958. In July of that year the Board concluded that its objective of collecting and assembling near-collision statistics had been achieved and no further benefit would result from continuance of the program. Therefore, the Near-Collision Reporting Program of the CAB was officially terminated as of July, 1959.

Soon thereafter the Federal Aviation Agency,



with General Elwood R. Quesada as Administrator, took over the CAB's Incident Reporting Program. When it became known, however, that reporting pilots were no longer assured immunity and now would be subject to disciplinary action, the pilots became reluctant to submit reports, and so the previous "many" reports became but a few. This, unfortunately, led some to believe the problem itself had become almost non-existent.

In December, 1960, the continued existence of the mid-air collision problem came into glaring focus with great suddenness when two transports, ironically operated by the same two airlines whose aircraft had collided over Grand Canyon, collided over Staten Island, N. Y., the proverbial stone's throw from Brooklyn.

Again, the public knew what the pilots had always known; that near-collisions must be occurring. In the spring of 1961 the new FAA Administrator, Najeeb E. Halaby, instituted a new approach to the program of pilot reports of near-collisions by placing it in the hands of a non-government, independent, non-profit organization, thus once more assuring reporting pilots of anonymity.

On June 8, 1961, it was formally announced that the Flight Safety Foundation had been chosen to develop a reporting program for obtaining data on incidents in which mid-air collisions have barely been avoided in the opinion of pilots and/or controllers. This program, in effect July 1, covers aircraft operations in the 50 states, the District of Columbia and Puerto Rico.

Pilot reports submitted to FSF will be destroyed after the statistical information has been extracted. Pilots need not identify themselves, thus assuring their anonymity.

The data obtained from the incident reports will be closely studied and carefully analyzed, and from this detailed analysis conclusions and recommendations will be submitted to the FAA for guidance in bringing about improvements in the specific areas designated by the pattern of reports. This, in essence, is how Project SCAN differs from prior programs.

Prior to Flight Safety Foundation's entry into the near-collision reporting program, all such programs have dealt solely with numbers, emphasis being placed on the magnitude of the problem rather than on possible areas of solution. Flight Safety Foundation's approach embodies incident-report analysis in depth so that corrective action can be taken either immediately or long-range, whichever need is dictated.

Pilot report forms presently are being printed and will be made available to all pilots within the next few weeks. Importantly, Project SCAN (which gets its name from "*S*ystem for *C*ollection and *A*nalysis of *N*ear-Collision Reports") covers *all* aircraft operations: civil and military.—*Flight Safety Foundation*

Penetrating a thunderstorm

The following, extracted from a USAF report on test thunderstorm penetrations by an F-106A at high speed and high altitude, may be of interest to Navy all-weather pilots.

THREE main problem areas were investigated and/or considered during this test program. The results of these studies are presented here, along with certain other findings.

Aircraft Control and Response
Subsonic Penetrations

No major problems existed for the F-106 during penetrations of building cumulus clouds and thunderstorms at subsonic speeds. In the nine thunderstorm penetrations accomplished at Mach numbers from 0.80 to 0.97, the aircraft responded quickly and positively to pilot corrections required by turbulence. Most of the pilot's attention was required in correcting roll disturbances during penetrations at subsonic speeds; pitch disturbances were small.

Supersonic Penetrations

Eleven thunderstorm penetrations were accomplished at Mach numbers from 1.2 to 1.9. Aircraft control and response were satisfactory, and at no time did the pilot feel close to being unable to recover from disturbances caused by gusts. Disturbances caused by gusts during penetrations at supersonic speeds were in pitch rather than in roll and it was this action which required the most pilot attention. Once displaced in pitch the aircraft tended to stay in the same nose-down or nose-up attitude; however, when corrections were made by the pilot, the aircraft responded quickly and positively.

Engine/Duct Performance

The main concern in engine/duct performance rested with the effect of an ice-crystal turbulence environment at both subsonic and supersonic speeds. The engine/duct gave no indication of marginal performance during subsonic or supersonic operation within thunderstorms or ice crystals which were encountered at speeds up to Mach 1.62. Earlier (September 1959), during tests conducted at Wright-Patterson AFB, Ohio, an ice-crystal environment was simulated by spraying water through a special nozzle attached to the refueling boom of a KC-135 flying at very high altitude. By flying the F-106 in this spray, the ability of the aircraft to withstand a high ice-crystal concentration at subsonic speeds without compressor stalls or other pen phenomena was adequately demonstrated. Flights through the Oklahoma thunderstorms confirmed this finding.

The presence of ice crystals was determined during the Oklahoma tests when an F-102 with a known susceptibility to ice crystals preceded the F-106 into the storm cloud and experienced numerous compressor stalls. Since the ice crystals, which are normally associated with the mature and dissipating stages of a thunderstorm, are of relatively long life, it was assumed that immediate re-entry of the cloud would still be flight into an ice-crystal condition. (The F-102 was flying in the same thunderstorm coincidentally with the F-106 for different test purposes.)

Duct buzz was not experienced during this test program. Although heavy turbulence was not encountered above Mach 1.24, an increased degree of turbulence should not cause a deterioration in engine/duct performance. As flight speed increases, gust velocity becomes a smaller percentage of flight velocity. Since turbulence changes either the direction or magnitude of the engine's inlet airflow, the effect of gusts on the inlet airflow will decrease as flight speed increases, provided duct airflow is essentially stable at the test airspeeds. Such appears to be the case with the F-106, since light to moderate turbulence was encountered without effects at Mach 1.8 to 1.9.

Continued

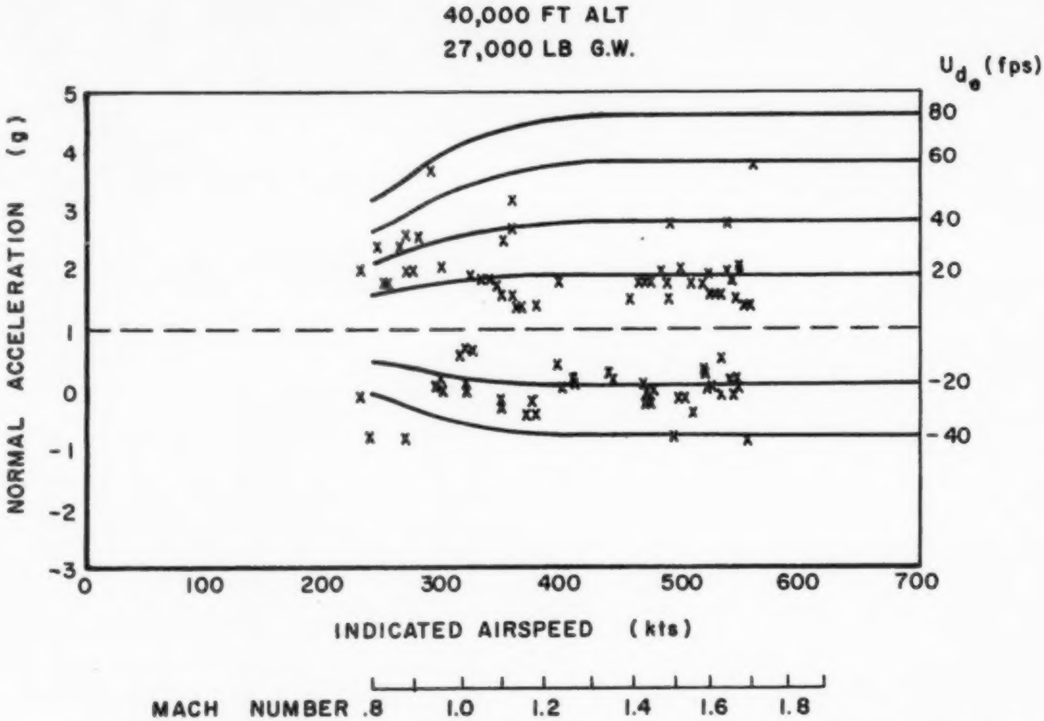


Figure 1. Normal Acceleration Vs Indicated Airspeed and Mach Number for Varying Derived Gust Velocities with F-106 Rough Rider B-g Data Superimposed.

Gust Loads and Velocity Information

Some of the data obtained on the V-g recorder during Project Rough Rider are plotted in Figure 1. (These points do not represent all the gust data because some runs were made at altitudes other than 40,000 feet and because the smaller gusts could not be read from the V-g recorder. The indicated airspeeds used to plot the accelerations were read from the V-g recorder and could be different from aircraft airspeeds because of the effect of gusts.) Included in Figure 1 are lines of constant derived gust velocity. These lines level off at a constant value of acceleration above approximately Mach 1.1 because the slope of the lift curve decreases at about the same proportion as the velocity increases.

Because of this leveling off, the higher gust velocities encountered at subsonic and low supersonic speeds can be experienced at high supersonic Mach numbers without exceeding design structural limits. In comparing thunderstorms encountered at the two test sites Oklahoma thunderstorms were more intense than the Arizona thunderstorms; pilot comments substantiated this.

Figure 2 shows the maximum positive and negative normal accelerations experienced on each run/flight and the Mach number at which they were encountered. As in Figure 1, the airspeeds used to calculate the Mach numbers were affected by the gusts. This figure shows the scatter of maximum accelerations experienced and the relationship of the Rough Rider data to the Hi Cu data.

It appears there is no ordered variation of turbulence experienced with Mach number and that the actual energy content of the storm is the primary factor in determining the accelerations imposed on the aircraft. However, this lack of order does lend credence to the results shown in Figure 1, i.e., an increase in aircraft velocity will not increase the acceleration for a given value of gust velocity.

It is interesting to note that on the two runs having the lowest mean gust velocities (U_{d_e}), the pilot reported light turbulence and that both storms were in the dissipating stage.

Thunderstorm Penetration Procedures

Standard thunderstorm penetration procedures for handling the aircraft were used at all speeds. Constant power setting was maintained after establishing the required Mach number/airspeed prior to entering the storm. Aircraft attitude and heading were used as primary references while in the storm. An airspeed range of 275 to 325 KIAS was established to satisfactorily cover the entire flight envelope. Unless a mission requires otherwise, the subsonic penetration airspeed should not exceed Optimum Cruise Mach number, in order to provide a more comfortable ride for the pilot. One penetration of a storm was made with the Mach number increasing to 0.95-0.97 with no unusual results.

Deficiencies

The pitot heater, the windscreen anti-ice and de-fog, and the canopy de-fog systems were inadequate during flight through the severe icing and/or precipitation conditions of the thunderstorms. Airspeed indications were lost on several runs. The windscreen iced or frosted over on almost every run. The canopy and windscreen consistently fogged over during descents which immediately followed a penetration. These were deficiencies also experienced during previous Adverse Weather tests and appropriate recommendations were made.

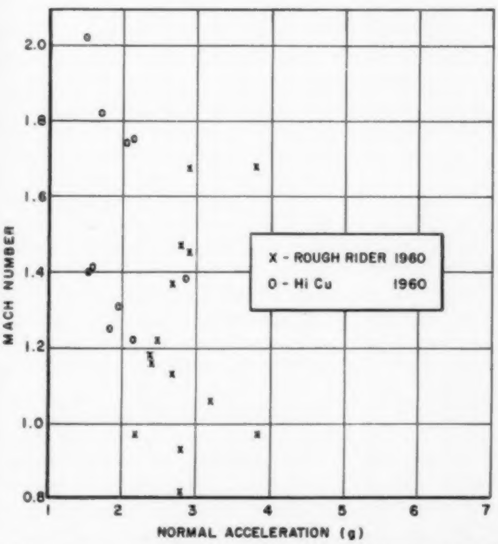


Figure 2. Maximum Normal Accelerations Experienced on Each Run/Flight and Mach Number at Which They Occurred.

Summary

Results of this test program may be summarized as follows:

a. The F-106A can safely penetrate severe thunderstorms, using standard piloting procedures, at subsonic and supersonic Mach numbers.

b. Best subsonic penetration speed at high altitude was at Optimum Cruise Mach number. Penetrations at Best Endurance Mach number were possible in spite of poorer aircraft response at this lower airspeed. An airspeed between 275 and 325 KIAS, not to exceed Optimum Cruise Mach number, was determined to best cover the entire flight envelope of the aircraft.

c. Penetrations at supersonic speeds up to limit Mach number will not exceed design limit load factors.

d. Engine performance was satisfactory at all altitudes, Mach numbers, and adverse weather environments tested.

e. Hail was not encountered at any speed during this test program.

f. The pitot heat, the windscreen anti-ice and de-fog, and the canopy de-fog systems were inadequate during flight through the severe icing and/or precipitation conditions found in thunderstorms.

g. Energy content of the storm system was the primary factor in determining the accelerations experienced when the aircraft made penetrations at speeds above approximately Mach 1.1.

h. The thunderstorms encountered in Project Hi Cu were of lesser intensity than those in Project Rough Rider and the pilots engaged in the flight program were able to detect this difference. In addition, the ranking of turbulence by the project pilot on subsequent runs in Hi Cu matched the data and the storm phase.

Conclusions

Intercept missions can be accomplished with the F-106A aircraft through thunderstorms at speeds up to and including limit Mach number of the aircraft, using standard thunderstorm penetration procedures. Thunderstorm penetrations at any speed should be considered of an emergency nature only, since the occurrence of hail may cause extensive damage to aircraft radome and airfoil surfaces.—*From Thunderstorm Penetrations by an F-106A Aircraft at High Altitude by George P. Roys, 1st LT, USAF, Flight Test Div., Flight and Engineering Test Group, Wright Air Development Div.*

UNCALCULATED-

BEFORE DECIDING TO VIOLATE MINIMUMS CONSIDER BOTH RISK AND GAIN

The crash report was concise and complete:

Aircraft making run on target failed to pull up and crashed through target into rough terrain. MB-5 crash crew with the assistant fire chief and field ambulance responded immediately upon notification. No service needed, wreckage scattered over a large area.

A witness described the accident in simple but vivid terms:

At 0630 I was orbiting the target as an aerial observer for a napalm exercise being conducted by A4Ds. I observed the aircraft strike the top of the billboard in the center of the target, hit the ground about 1000 feet past the target, and disintegrate in a rolling ball of flame. His speed on impact was about 500 knots.

He crashed on his second run. On his first run his hit was a bullseye. It is possible that, in an attempt to duplicate his previous hit, he was too aggressive in his run.

The squadron commander conducted a thorough briefing prior to the flight. All pilots were present at this briefing. One of the points emphasized was a minimum altitude of 50 feet over the terrain.

A portion of the Flight Surgeon's report offered a reason for the low altitude:

The only psychological factor which may be pertinent is the fact that he had recently competed in three exercises and had failed to get an "E" in bombing. During his last flight, he was participating in another competitive exercise. He made one run on the target and scored a bullseye. One more bullseye would mean an "E" for that exercise. . .

An associate gave some insight to the pilot's philosophy on low level bombing:

He was getting consistently good hits on the practice hops before the CompEx and said that the "gouge" for getting bullseyes was to come in as low as possible and pickle late. He said that if you came in lower than the top of the target structure, the bomb could not possibly go over and had to be a bullseye.

He had said previously that twice during practice runs he thought he was going to hit the pole that projected above the center of the target structure. This pole was broken off by a bomb prior to the CompEx.

I'd like to add that after the squadron had made a large number of practice hops most of the corrugated iron covering at the top of the target structure had been torn away by practice bombs and you had to hit toward the bottom of the structure to get bullseyes consistently.

Damage to the aircraft:

The aircraft struck the top of the steel 29-foot high "billboard" structure in a slight nose-high attitude. The wing cell was thereby ruptured and shortly thereafter, fire and explosion occurred. Aircraft wreckage was distributed from target center to a point 4500 feet from the bullseye.

After assimilating the facts disclosed in the investigation, the accident board determined details of the impact:

The aircraft was flying at approximately 20 feet at a speed of 512 knots along the run-in line. After pickling, the pilot commenced a pull-up but had insufficient time to accomplish the maneuver and clear the billboard.

-RISK

Statements of witnesses indicate that the pull-up was, indeed, started.

Calculations of run-in techniques show the dangers of delay in firing:

Pilots were instructed to fly the run-in line between 50 and 300 feet of terrain clearance. Run-in speed was to be 500 knots TAS. Prescribed gunsight mil setting was 26 mils. In this maneuver, pickle point is when pipper meets the base of the target billboard.

Computations show that at 20 feet and 500 knots TAS the farthest point at which the particular projectile may be pickled and strike the base of the bullseye is 696 feet. Pickling before this will result in a 6 o'clock hit. Had the briefed mil setting been employed and the pickle delayed until pipper met the bullseye base, this distance would be reduced to 592 feet.

In the first instance, time remaining for pull-up before the aircraft strikes the billboard is slightly less than 8/10ths of a second; in the latter case 7/10ths of a second. It is obvious that in these circumstances, the slightest delay, intentional or otherwise, would make collision inevitable.

An inquiry into altitudes to be used brought up some pertinent information.

FXP-2 states that exercise A-8-R is to provide training in Napalm/Laydown bombing. It also states it shall be conducted at an altitude of from 50 to 300 feet.

NWIP 20-1 tabulation minimum release altitudes for Napalm bombs as 200 feet for practice and 100 feet for operational use.

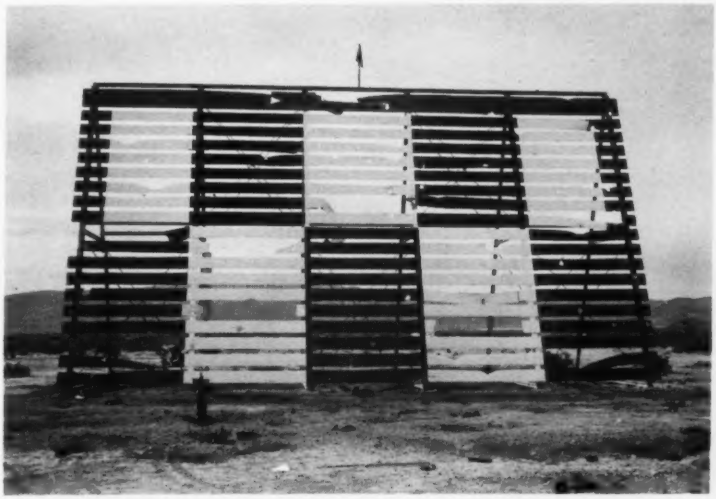
ComOpTEvFor Reports list 75 feet as the minimum altitude for "laydown" delivery by the A4D-2.

The Air Group Commander recommended one standard be adopted:

In spite of these apparent inconsistencies, no realistic training for these deliveries can be attained at an altitude of 50 feet. Common sense should have dictated no less than 100 feet as a good and reasonable realistic minimum altitude above the terrain (and terrain should mean the highest object on the flight line which in this case is the 29-foot billboard at the target center).

The Fleet Air Commander concurred:

Since no realistic requirement exists for training flights to be flown at an altitude of 50 feet, all Fleet Air units are directed to maintain an altitude of at least 100 feet on all weapons training flights.



BEFORE and AFTER

WEATHER

Pitching Decks

The senior member of the committee informed the council that thorough briefings on 'pitching deck' techniques were to be held for all pilots prior to commencement of flight operations in the North Atlantic.—*USS* SARATOGA

GCA-1932 Style

"When the ground man picks up an approaching ship, the pilot will be asked to 'blimp' his motor for identification. United Air Lines will be one blimp, American Airways two blimps, and Western Air Express three blimps. When it has been established that yours is the motor we are hearing, you will be advised of your approximate position and direction from the field, and we will continue to advise you until you arrive over the field and you inform us that you are ready to come down through."

"If in your opinion, you are in position to come down through, we will give you an okay. Jazz your motor at frequent intervals as you come down, and we will advise your approximate position. When your plane is sighted underneath, we will tell you where you are, and give surface wind and any unusual field instructions. You should advise us as soon as you see the ground." Seely Hall's Scrapbook—1932—*NAS Whidbey Island Newsletter*

Know Your Pilots

Evidently, the surveillance of pilot habits and tendencies has not been strict enough and there seems to be an attitude of "it can happen to anyone." This is evidenced in the AARs where statements such as "it is inconceivable that a pilot of this experience level and with this much model time was not familiar with the necessary procedures." The above statement is only one of the myriad of excuses that Commanding Officers and Safety Officers are giving for the actions of their pilots. It all points to the fact that the Commanding Officers and Safety Officers do not really know their officers and their problems which affect their flying capability and decisions.—*ComNavAirPac*

Emergency Reporting

Pilots when experiencing an airborne emergency normally report this fact to the tower personnel and then shift frequencies to base (squadron) radios for assistance and analysis of the emergency. From this point on no further word is passed to the tower personnel. This leaves the tower personnel in a state of indecision as to what course of action to follow in regard to Search and Rescue.

It was resolved that this problem would be rectified on the squadron level. It shall be the responsibility of squadron personnel operating the radio to keep the tower and NAS Operations personnel informed of the situation as it develops. —*Southern Aviation Safety Council*

MONITOR

Radar Separations

Boston Center said that aircraft can be radar controlled out to approximately 60 miles when above 3000 feet and out to 80-100 miles when above 8000 feet. Controllers will maintain aircraft at required separation until handed off to another Center. Flight plans for aircraft departing Quonset to the south are sent to the security stations in both the New York and Boston areas since the air station is on the border line between those two centers.—*ComFAirQuonset*

Weather Information

A recent incident involved poor weather information, wherein the tower and GCA unit were not in agreement on weather conditions at the field. It appeared that the GCA unit was a little behind the tower in the matter of current weather. This offers a distinct hazard to incoming aircraft as they shift from tower information to reliance on GCA.—*Brunswick Area*

Portable Approach Lights

It was suggested that a portable stroboscopic high intensity approach lighting system be developed. This system could possibly use lights similar to the source lights of the portable mirror. Single lights connected by the power supply cord could be laid out as an extension of the runway center line to aid pilots in low visibility approaches. The system would be portable and could be used as an adjunct to the self concept.—*1st MAW*

San Diego IFR Saturation

Considerable discussion was directed toward the subject of instrument flight procedures in the San Diego complex under IFR conditions. Recently, under IFR conditions, 20 jet aircraft were directed to alternate airfields because of low fuel states and delays due to runways being fouled because the emergency field arresting chain had been used. It was pointed out that pilots should expect delays up to 20 minutes when the emergency chain has been utilized. Mr. Eric Larson, acting Deputy Chief of NAS Miramar RATCC, spoke on "Air Traffic Control" and made the following points:

a. Fuel consideration at destination under IFR conditions taking in consideration of runway fouling.

b. Encourage pilots to practice and utilize IFR system in VFR weather.

c. Pilot responsibility on an IFR flight plan in VFR weather. ATC allows for separation of known traffic, but it is the pilot's responsibility to see and avoid air traffic when in VFR conditions.

d. Increased number of aircraft arriving over the San Diego terminal area in low fuel state. This usually results from poor planning and leads to much confusion under IFR conditions.

—*Fleet Air San Diego/NABS 11 Joint Aviation Safety Council*

KNIGHTY *Night*

I'm a fairly experienced naval-type aviator with almost six years of military flying, a tad under 2400 hours and a spotless safety record. Most of this time aloft in aluminum contraptions has been directly behind a single rotating prop with a few jet hours back in the training command and a casual introduction to that old friend, the *Beechcraft*, somewhere along the line. For the past few months, since spending a few weeks at Ellyson Field, I've been driving these machines with wings which revolve rapidly immediately above the APH-5.

But never have I honestly felt that I should sit down and take up your time with any of my experiences. I've had a few thrills but no real hairy tales worthy of mention until the other night. . . .

My SAR copilot and I were called out of the shack by the staff duty officer with instructions to meet an emergency air-evacuation aircraft at a nearby AFB and take a litter patient to a naval hospital which is just down the road a piece from here. The weather has been P-poor to below all afternoon and evening with a low overcast and a heavy steady rain but it was gradually improving by this time.

We checked the present weather (note the word present) at our destination; also at an NAS near our intended route of flight and here at the facility. It was marginal for night SAR so we waited for the next sequences which were due in a few minutes. These were more favorable and by the time we routed out our crew, preflighted and launched into the black in our trusty HRS, it was going on 2330.

We found the visibility to be good to excellent enroute with scattered low clouds well in the distance and we spotted the rotating beacon at the field around five to eight miles out. My copilot checked out our navigational gear (which happens to be a loop antenna) and found it was working perfectly. We used it as a double check on our track.

The evac plane was just shutting down as we landed at the heliport and we had our patient aboard and were airborne again in about 15 minutes. An Air Force nurse from the base accompanied the patient and the trip back was uneventful and with no noticeable change in the weather.

The procedure in these cases is for the nurse to merely turn the patient over to the ambulance driver after which her mission is completed. She then faces a three-hour bus ride back. It was then going on 0100 and with the age of chivalry being still very much alive, inter-service friendship, togetherness and all that jazz, we decided to take her home—back to her base, that is. Besides, another hour of night time in the log sure wouldn't hurt.

Now here is where the plot (and the weather, as it turned out) thickens. As we approached the air base this second time, we noticed the weather deteriorat-

ing to the westward in the form of ground fog and low clouds. At this time the control tower's transmitter chose to get sick and approximately five minutes were wasted until we finally were forced to go to guard channel to get landing instructions and clearance. We landed, the nurse waved her thanks and we immediately departed. The tower was now operating on its back-up transmitter.

It was my intention to proceed eastward to get away from the foggy area which we could now see around the field before turning on course. Three or four minutes later, through an unforgivable error in judgment on my part, we were hopelessly caught in solid dense fog. It had not been "moving in" as I had thought. It had been forming under ideal conditions over the entire area. The possible air traffic in our present location, the myriad of high-tension wires which we knew to be all around underneath us, and that blasted tower transmitter behind us convinced me we shouldn't go up, go down, or go back.

I'd be lying if I said I wasn't shook but calmness prevailed and we turned toward the all-weather NAS which was roughly between our present position and home. Now this old bird of ours isn't supposed to be flown under actual instrument conditions but I've always been of the opinion that it would perform adequately in an emergency and in smooth air.

It seemed that I had an opportunity now to prove my theory. I've had enough instrument experience to cause me to have my eyeballs very solidly glued to the gages by this time as we switched to primary Navy tower frequency, contacted the tower and requested an immediate GCA. My copilot had tuned the NAS homer, adjusted the null and we commenced tracking inbound. We were given a GCA channel in what seemed to be 30 minutes but what was really only three. The controller answered our first call and what a beautiful sound it was indeed to hear his reassuring voice. Two identifying turns later and we were on our base leg making an ASR approach. We spotted the runway lights at one mile and I have never seen a prettier sight.

Needless to say, we secured for the night, called our duty officer and proceeded very thankfully on slightly weak legs to the transient BOQ.

What's the lesson to be learned? It's obvious, emergency flight or hole-boring alike—check the forecasts as well as the present weather. Had I done it I would have not likely been quite so eager to make that second trip. I told flight students for two years to do it (although this bone-headed stunt certainly doesn't indicate it) and I know it as well as I know the difference between a rotary and a fixed wing.

Chopper drivers should review all aspects of instrument procedures continually even though our work is predominantly in VFR conditions. It's so easy to get rusty. And it wouldn't hurt every once in a while to dig out an aerology manual and review it either.

Now what was that nurse's name again. . . .

Pin Check

What: Started engine and taxied out with firing safety pin installed in ejection seat.

Where: Douglas-Rapec seat in A4D-2N.

Why: Helpful plane captain and unobservant pilot pulled pins. But, banner on seat safety pin was hanging down starboard side of seat. Since some @#$¢%*& put a four-inch, stainless steel line from banner to pin, all of banner was hidden from view, flush against seat's starboard side.

When: Prior to taking the duty runway, pilot checked rear view mirror to look inside cockpit . . . saw red . . . turned white. Returned to line to get pin removed, then made the hop O.K.

I feel strongly that *all* safety pin banners in the cockpit should be lined together. Of course, I am the pilot and feel foolish that I almost took off with an unusable seat: The pin should have been spotted before I got in. But I was soothed by seeing no red banner (and so was the plane captain who is very experienced in A4Ds).

I am thankful that I have de-

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Forms for writing Anymouse Reports and mailing envelopes are available in ready-rooms and line shacks. All reports are considered for appropriate action.

— REPORT AN INCIDENT, PREVENT AN ACCIDENT —

veloped the habit of watching my controls move (rudder, and stabilizer-elevator) in the mirrors while the clamshell canopy is open. Then, when it is closed, I check the inside of the cockpit. From now on I'll do both checks on the line.

NO MAN'S LAND

A WEST Coast jet base had one of its parallel runways closed due to new concrete and construction of water squeeze arresting gear. At the 7000-foot position a high asphalt bank stretched across the entire width of the runway. A real "stopper" of a barricade.

The field did its utmost to alert people to the closed runway; NOTAMs were kept current and put on the teletype, red "X" banners were in position at both ends. of the runway. All this failed to impress one FJ pilot.

He called gear down and locked then lined up for 24L, the closed runway. His wingman told him "24 Right." The tower told him "24 Right." The RDO and wheel watch fired flares. Still the FJ made his final landing on the right side of 24 Left.

The pilot admitted he heard the voice instructions but to him they only meant "line up to the right of 24L," and that was where he was aimed so he held what he had. He said he saw no flares.

This pilot was lucky to turn off a thousand feet in front of the asphalt bank. Until he saw that obstruction he hadn't realized what it was all about.

ME LOST? . . . OF COURSE NOT!

LIGHT is thin. Horizon hazy. Stirring on her misty couch below, night waits to creep aloft . . . "Fuel is low and radio sputtering. Lusty engine — gulping greedily."

Expectant eyes scan left and right. In vain. No concrete strip unwinds ahead to mark a haven . . . "Course with care I plotted, and calibrated speed to true."

Destination is open. No front bars the way. But racing minute hands have moved the ETA behind . . . "Has wind, in its airy way, shifted, and pushed me from my track? Demon engine —drinking gallons!"

Flight log is scribbled obscurely. No trail to earth is arrowed there . . . "Distance and heading I double checked—could the damned field have moved away?"

Damp fingers with surgeon's touch ease mixture back another notch . . . "No spot below is familiar to my chart and sky ahead is trackless. Monster engine! Swilling barrels!"

Unknowing of human urgency, the grey ribbon waits in windswept isolation . . . "A square search can save the plane and bring my wheels to concrete . . . Minutes left. No time."

With greater majesty than proudest work of *man*, the runway edges into view and expands to flat salvation . . . "There it is! Bearing 3-5-0 relative. Traffic pattern in three minutes, coffee

ROUTINE NIGHT FLOP

SPECIAL FROM THE FLEET—This late night launch, aboard the USS AGOTARAS cruising in the icy, black waters off Norway, began essentially as any other routine night hop, in sheer panic. To start things off, I was thrown into the "black sock" that fateful evening entirely by mistake . . . my aircraft was definitely "down" due to a faulty outside-air temperature gage. I didn't discover this down-gripe until after catapult tension had been taken, and when I turned all the lights on bright (so they could see my "thumbs-down" signal) . . . well, you know very well what happened. So there I was, and my enviable record of seven cruises without one single night sortie went right down the drain.

After a quasi-routine round-robin (Reference my Near Miss Report 17-61) and a perfunctory return to the ship (Ref. Flight Violation Report 7-61, charges (3) and (5) RTPCA 558), a Carrier Controlled Approach was commenced. The CCA Officer screamed at me so much I finally gave up and climbed back to altitude to await my original Approach Time. I was merely trying to expedite the recovery.

My first waveoff was uneventful, and the LSO was back up on the platform in jig time. The next pair of bolters will not be covered here, as they are discussed separately in some other kind of report, or something. As I executed still another waveoff (to starboard this time, due to being rather "racked-up" in close), Pri told me to "bend

in ten or twelve. Dependable engine, turning smoothly."

Flight plan closed and tanks topped off. You've come a long way the duty officer says, "Any trouble?" . . . "Oh, no trouble. The hop was fine. Tired I guess, that landing I sure bobbled . . . Well, good night."

Trouble Adrift

The HUS was flown from home field to an outlying field about one-half hour away. Cargo to be picked up consisted of a heli-team of marines and because of weight consideration no crew chief was aboard.

Pickup was routine but just as the HUS became airborne, the heli-team leader, an alert and quick-thinking young lieutenant who was seated directly under the pilot, began slapping the pilot's legs and indicated by hand signals that something was wrong and that an immediate landing was necessary.

At this instant the pilot smelled the unmistakable odôr of an electrical fire. He secured the battery switch, landed and secured the aircraft. The lieutenant had his troops clear of the cabin by this time.

Later the lieutenant explained that at the point of takeoff the aft end of the troop compartment seemed filled wib sparks. Investigation then uncovered these facts: A .30 caliber ammunition box containing tools had been left between the APU and the side of the cabin. On top of this ammo can was a metal hammer.

Vibration caused the hammer to move and make contact with the low voltage lead on the APU motor. The circuit was then shorted through the hammer and steel box to the deck of the cabin. Face of the hammer was burned quite badly and a ¼-inch hole was burned in both the top and bottom of the ammo can. No damage was done to the helicopter.

Such things as tools, grease cans . . . are necessary for maintenance but are very often left unsecured. This requires attention from flight line supervisors and for an internal preflight by pilots. There is too much gasoline in the general area for electrical sparks to be arcing about.

P.S. The platoon leader became duly concerned when he saw the sparks, thinking there was ammunition in the can.

● ● ● ● ●

Occasionally, little gems appear in teletype messages and in accident and incident reports that tend to lighten up some otherwise somber reading. Here are a few choice quotes:

PILOT EXECUTED A LANDING WITH AFFECTED EAR IN THE FOAM.
(One point landing?)

THE PILOT WAS ATTEMPTING A CROSSWIND LANDING WHEN THE WIND GUSTED THEEEEEEEE EEEEEEEEEEE EEEEEEEEEEEE
(Please don't tickle the teletype operators.)

THE PILOT WAS UNABLE TO RAISE THE TOWER FROM THE FRONT COCKPIT.
(Weak pilot)

PILOT TOOK THE RUNWAY AND RAN UP THE ENGINES.
(And when he got there what did he do with the runway?)

SUBJECT TURBINE IS BEING HAND CAR RIED TO O&R.
(By Chief Samson?)

—Convair Design Safety Review

it around." Unfortunately, an A4D was catapulted just as I whipped my aircraft across the bow. Very luckily indeed, however, the A4D pilot saw me in the nick of time and dove forthwith into the water. . . .

The next attempt to get aboard gave me somewhat of a shock. Actually, it was a real good shock inasmuch as I left a good deal of my undercarriage back on the ramp . . . I guess I must have been a bit low. Anyway, I whistled right on up the Angle (proof-positive of good line-up) and was logging night time once again. I was informed that I must orbit a spell while the ship erected the nylon net, which I did with no small amount of relief . . . a chance to have a smoke or two. . . .

Now we come to the subject matter of this report . . . the incident. Everything was going smooth as glass right up to the time I engaged the barricade. In all fairness, I didn't actually "engage" the barricade, but rather only a portion of it; the starboard stanchion with my port wing, real hard, too. There ensued a great display of sparks, and pieces, and all manner of things. I sensed immediately that I had an emergency situation to contend with.

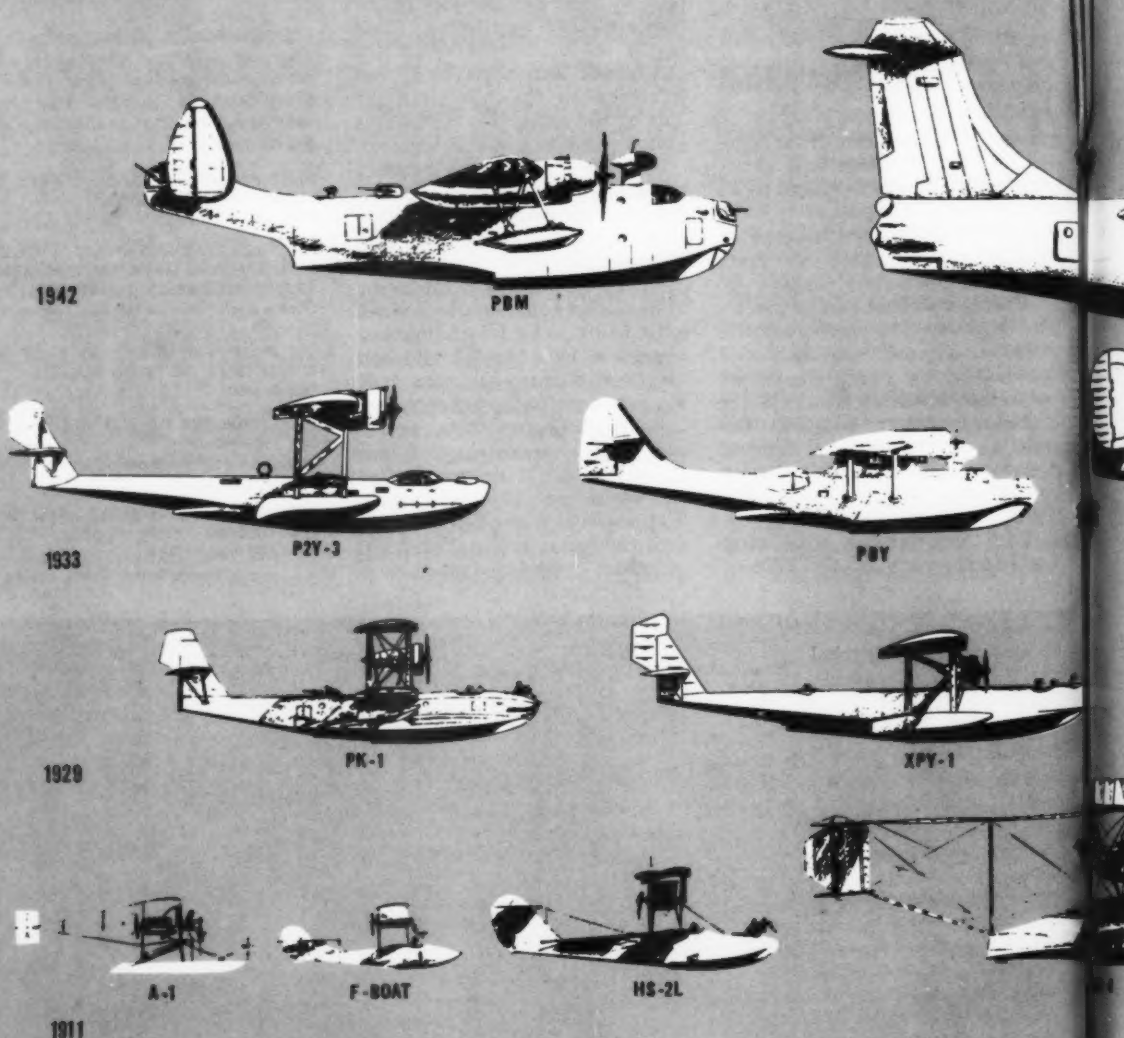
I didn't have much time to do anything, however, before my forward travel was terminated. This was a right smart jolt too . . . as I'm sure the Tilley driver would gladly confirm, were he available. . . .

I was finally compelled to leave the airplane and chalk it all up as a rather bad go. The Air Boss, and a few others, met me at the Island . . . and other than that, I received no injuries as a result of the accident.

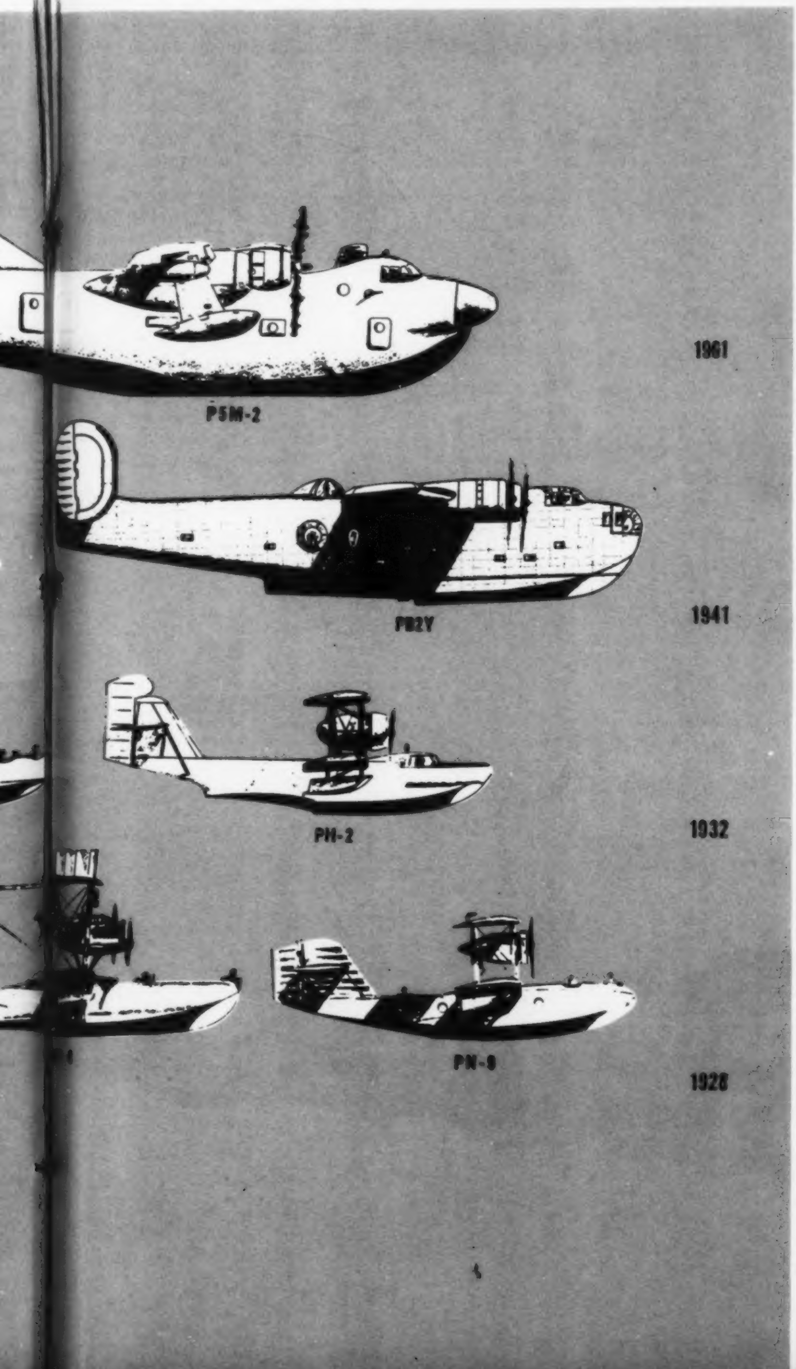
I see no way in which I could have prevented this accident . . . once you have hit something like a stanchion, there just isn't much even the most experienced aviator, like myself, can do.

LCDR D. H. Howard, VFP-62

DEVELOPMENT OF U.S. NAV



NAVY SEAPLANES



A full 50 years of Naval Aviation is spanned in these 13 airplanes. All are flying boats except the A-1 *Triad* of 1911 for the simple reason that there were no "boats" till 1912. From that date the Navy has never been without them.

A complete chart of seaplanes either tested or put into production would require over 30 drawings, thus some old favorites do not appear here. One which deserves special mention, the Martin *Mars,* will appear later in a chart of Navy transport aircraft, as will the UF.

The story behind the XPY-1 is a small slice of history itself. Consolidated (now Convair) designed and built it. The navy accepted it but Martin made the low bid for production units and received the contract. Thus the XPY-1 came to the fleet as the P3M.

These drawings are made to the same scale so the growth in size is evident along with the development of design.

What the next 50 years will do to seaplanes is open to speculation. Aviation trade publications offer little evidence that new military seaplane designs will be forthcoming despite their continued use in many military forces throughout the world.

But as long as men go down to the sea in ships the odds are that the Navy will send some of them in seaplanes and the art will not die.

Have a problem, or a question?

Send it to

headmouse

U.S. Naval Aviation Safety Center,

Norfolk 11, Virginia.

he'll do his best to help.

For Vehicles Only

Dear Headmouse:

A decal has recently been applied to the instrument panel of our station aircraft. This decal presumably interprets control tower light signals as they apply to airport/aircraft ground traffic. However, the meaning of a steady green light is listed as "Cleared to Cross" rather than "cleared for takeoff."

A steady green light may be appropriate for a taxiing aircraft or vehicle to cross a runway but it certainly is not the primary meaning of the signal. It is felt that this decal should correctly translate the foremost meaning of a steady green light on the ground.

ANYMOUSE

► Whoever put the decals in aircraft may have meant well but his action was in error. These decals were intended for use only in ground vehicles which may be required to operate around ramps and runways. (Incidentally, the decals are still available upon request; a postcard or Anymouse report is OK.)

Very resp'y,
HEADMOUSE

Headmouse

Logging Dual Time

Dear Headmouse:

We fieldmice need help; we need an interpretation of OpNav Inst. 3760.8 as it pertains to logging first pilot time. We know that this is not proper procedure but we need a rapid, reliable answer and for reasons of rank structure, command relationships and badly frayed tempers we would rather not go through official channels unless we have a strong indication that the interpretation will be in our favor. You seem to be our only hope. We have agreed to ask you to answer me, as spokesmouse, directly and to use your reply to decide whether or not to launch a letter through channels for a final decision from CNO.

The situation is this:

VMT holds periodic, two-week duration instrument flying courses to which local aviators are assigned TAD. VMT logs all simulated instrument flying time of pilots attending these courses, except for instrument check flights, as dual pilot time. Their principal reason seems to be that they are reluctant to give us first pilot time if we are not F9F-8T qualified—and they do not let the mere fact that several of us *are* so qualified deter them in applying their policy. (This policy, carried to its (il)logical extreme, would prevent any pilot from checking out in a new aircraft by preventing his ever logging that vital first minute of first pilot time but we graciously ignore that absurdity.)

Our objections are these:

1. The policy seems incompatible with OpNav Inst. 3760.8 Part 1 A 5 which differentiates between naval aviators and naval student pilots and emphasizes, by underlining, the term "*student pilots*" when defining dual pilot time. We feel that a designated naval aviator, possessed of a valid instrument rating, does not become a student pilot by boarding a VMT aircraft but remains a naval aviator, *practicing instrument flight*, and, thereby, earning first pilot time.

2. The principle that a pilot can earn simulated instrument first pilot time only in aircraft in which he is considered fully qualified is invalid on its face as he is allowed, by OpNav Inst. to fly his check flight in any aircraft and then to apply his card to all others.

3. If the instruction were written with the intent of leaving it open to local interpretation, that interpretation should be the prerogative of our several commanding officers and not of a command to which we are assigned two week's TAD.

4. Simulated instrument dual pilot time will not count toward annual minimum requirements. The instrument flight course thus becomes a detriment rather than a benefit to all commanding officers who send an officer to it. They lose an officer's services for two weeks and still must find somewhere the fuel necessary to refly all that time. Many of us, especially those from post and station units, will be severely embarrassed when we have to explain to the skipper that we have not satisfied one minute of our requirements—and virtually all of us used that lever to wangle an assignment to the class. We question whether the Marine Corps can afford this policy under current TAD and fuel allotments and we know that our units cannot.

CAPT H. A. MONTEAU

Rt. 1, Box 347
Newport, N. C.

► After some soul searching we are forced to agree with you

that *all* hooded time should be logged as simulated instrument first pilot time, providing you are a designated Naval Aviator. The system as you describe it would definitely prevent the use of such time toward minimum requirements for instrument rating in accordance with OpNav Inst. 3750.2A.

Very resp'y,

Headmouse

Flying Mistake

Dear Headmouse,

I have just come upon a possible aid to your problem of reducing pilot factor accidents.

My wife, who is on a trip around the world, informs me that she saw in the main foyer of the airline terminal of Djakarta, Indonesia, atop a pedestal, a fully outfitted Indonesian pilot (flight gear, helmet, life-jacket, ...). Her interpreter said that he was being punished for making a "flying mistake" and must remain there for 12 hours for all to witness.

Think it'll work here?

C. G. LIVINGSTON, CDR

Redondo Beach, Calif.

Flashlight Wear

Dear Headmouse:

A question has come up which I cannot answer: Why is it necessary to shift the one-cell flashlight on the MK-2 life preserver vest after vest inflation?

ANYMOUSE RIGGER

► BuWeps says,

"The light, as normally stowed in a loop on the right lobe of the life preserver, is in the best position for wear so as not to interfere with the parachute harness. This position is not, however, the optimum location for transmission of light and prevention of glare in the wearer's eyes. Thus, after the parachute harness is removed and the life preserver is inflated, it is recommended that the light be transferred to the loop on the left shoulder which has been selected as the optimum location.

"A light is currently under development which will project a narrow beam of parallel light rays. The light is emitted around a complete 360-degree circle. The beam center has an elevation of 5 degrees above the horizon. Motion resulting from wave action causes the beam to raise and lower. Thus, the location of this light on the life preserver will not be critical and it will not be necessary to change location."

Very resp'y,

Headmouse

Use 'em or Lose 'em

Dear Headmouse:

During the conduct of recent AdMat inspections, I noted with alarm that the squadrons were not utilizing the OFT for their respective aircraft. The OFTs were developed, at considerable cost to the Navy, to simulate flight of a particular aircraft and to offer realistic training that can be conducted in a *safe* and *inexpensive* manner. These trainers give excellent training in instrument flying and particularly for emergency procedures.

I am acutely aware of the heavy operating and training commitments placed upon all squadrons during the limited shore based deployments you occasionally are fortunate enough to receive. However, a squadron should be able to squeeze in a period a day for this important training. A squadron of 15 pilots sending one pilot per day to the trainer would mean each pilot would receive valuable refreshers every three weeks. This seems justifiable and certainly worthy of the time spent.

During the past year the OFTs in this area were utilized as follows:

A4D-2N	NAS Jax	29%
F3H	NAS KWest	14%
F4D	NAS KWest	30%
F8U	NAS Cecil	Well over 100%.

From the above, it is quite apparent the *Crusader* boys know the importance of these trainers.

To add a little further ammo to this; I have it on good authority that unless these trainers are utilized, to at least 50 percent, we will lose them. I personally do not feel we can afford the loss. These trainers are certainly a useful and necessary tool of the ASO in his safety program of accident prevention. Use them now and at every opportunity.

WILLIAM G. DAVIS
Staff Safety Officer

ComFAirJax

►Amen

AD 'Up'-'Down' Signal

Sir:

At the request of the Aircraft Handling Personnel aboard this attack carrier, squadron pilots are giving the thumbs-up — thumbs-down signal upon clearing the gear to men stationed outside flight deck control.

With the high power on the AD-6 and high wind conditions prevalent during this phase of deck operations, we feel it is paramount for the pilot to maintain stick control and throttle control requiring both hands in the cockpit. This would eliminate the signal. The Aircraft Handling Personnel feel this signal is necessary for smooth operations.

Please comment on this situation.

ANYMOUSE

► Such signals may induce a bit of apprehension on the part of relatively new AD operators upon turning loose the stick momentarily. On the other hand we know that a downed aircraft incorrectly spotted will certainly bollix the respot operation because it will involve aircraft handlers, elevator operators, pri-fly, operations and maintenance people unnecessarily. While the signal may seem the lesser of the evils, NASC strongly recommends other means of determining aircraft status.

Very resp'y,

Headmouse

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no connection

AFTER briefing for an instrument hop with my wingman, we went to our A4D's. Preflight, strapping in, all went as it normally does. I make it a practice to check my oxygen system by fastening my mask and trying to breathe, then turning on the oxygen switch. I performed this check and the mask was airtight. After a normal start we proceeded to the duty runway. We had to wait for landing traffic for several minutes.

Takeoff clearance was received and takeoff and climbout was uneventful. I made the call to TACC and got a radio check on tactical with my wingman. I had planned to fly to Miramar, Yuma and El Toro, flying on the gages and getting to El Toro with enough fuel to make three approaches. In the briefing, my wingman had asked questions concerning the use of the autopilot, particularly engaging the altitude hold mode. I called him and said we'd level at 29M on the autopilot to demonstrate how the aircraft reacted. I had planned to write down the exact altimeter readings for future reference. For some reason, I didn't look at the altimeter to make sure of these readings. I knew I should be at 30M so I climbed and continued to Miramar and turned for Yuma, tracked out of Miramar and switched to Yuma TACAN . . . After a TACAN check, I had trouble writing the number "8" and took several tries to do it legibly . . . my writing didn't look right.

I decided to turn for El Toro early for fuel economy and thought I'd better check visually my area for the TACAN confusion and to make sure we could pass between the restricted areas. I looked for Yuma but couldn't find the field though I could find Pilots Knob. Having operated from Yuma, I knew I should be able to find the field and thought it was odd that I should be confused.

For some reason, I looked down into the cockpit towards the AFCS panel and saw my mask mounted Firewel regulator swinging free. This was odd also. At no time did I think I had any trouble up to this moment.

I grasped the hose and felt the oxygen blowing in my face. I knew I had to descend to 10M. I tried twice to tell my wingman but couldn't get an answer. I decided I couldn't wait any longer so I rocked my wings, turned inverted, speedbrake out, and pulled through. I thought that having flown ADs, my wingman would understand the wing rock and follow. We had had difficulty with communications when he was not in close. I don't remember retarding the throttle. As I saw the ground move under me I thought this is the target area and it will be a good run. I had planned to go to ram air passing 17M and pull out at 10M. I knew I was diving but there was nothing wrong with that. I tried to gage my pullout so as not to overstress the bird at 10M. My gages said I bottomed out at 10M and climbed to 11M. My wingman now went by me over running 200-300 feet. He couldn't fly formation and that was funny. I'd really have a good time when we got home. But I thought, he's got 500 hours in type and is a good pilot—*I* must be doing something wrong.

—Wingman:

As the lead pilot rolled out on a westerly heading at 30M he suddenly rocked his wings real fast, then split "S" straight down. I rolled over after him in a vertical dive, power at idle, brakes out and was going .86 mach with a 300-gallon centerline store. I still could not catch him. I finally caught him at 1000 feet straight and level. When I got in transmission range, he mumbled that his mask had separated and that he thought he had hypoxia and that he wanted to go home. I then advised him to go to 10M, level off on autopilot to clear the mountains, and go to ram air so he would not get oil fumes from the 13th stage compressed air . . . I kept up a small chatter to keep him on his toes and let him know that I was right with him.

So I checked my cockpit . . . speed brakes were in, no light, power was at idle. I added power and pulled my Hardman fitting open on the right side. I put the regulator in my mouth and turned the oxygen back on. I had shut it off when I was diving to save what I had left. I don't

remember looking at the gage. I thought that everything was okay now. My wingman was talking to me and seemed to understand what was wrong. I shut off the oxygen and told him I was okay and wanted to go to El Toro although El Centro was right off the port wing. He told me to go to ram air and hit the altitude hold. I thought I had gone to ram air already. I looked down but am not sure if I did or not. I tried to write on my kneeboard what had happened. I couldn't read what I had written very well so I went to the oxygen again.

By now I could see my way home—Palomar, George AFB and Saddleback. Everything was fine, my fuel was good, too good. I wanted to be lighter on landing so I told my wingman I'd orbit the field and I was okay. While breathing from the regulator, my mouth would get dry and I'd stop for a while. I probably did this at least 6 or 8 times before we went in to land. I tried reading my gages to my wingman and he nodded. Each one cross-checked so I felt I was okay now. I didn't want to break my habit pattern so I asked him to tell El Torro I would make a circling approach. I asked him to fly my wing to check my gear and flaps as I felt I could still use the help and asked for the crash crew to be out. I now began to orbit the field at 8000 to burn down.

Wingman:

We arrived over El Toro after erratic altitude flying at 8M and commenced a left orbit in a 60-degree bank. When transmission could be read by him I told him to shallow out of his steep bank. He finally shallowed out after 3 turns around the field at 350 knots. I then decided that he better get on the deck as soon as possible since his flying was not getting any better. By the looks of things I thought that he might be going to the other extreme — hyperventilation. I informed him of these things and finally got him to agree to go in and land.

I remember I was relaxed and thought it was no problem now. My wingman said I was not doing any good and we were going in to land. I told him to tell the tower I'd make no transmissions and I went to channel 4. The tower gave clearance and I headed up the duty at 2000', a slow, shallow break, 200 knots, gear down, flaps down and set 80 percent on the throttle. I tried to keep the doughnut in the AAI lit but couldn't. My wingman said I was slow so I lowered my nose and added power. He said I was too low so I added more power and thought I was doing just fine but he said power so I added it.

As I came up to the ramp, I heard someone say shut down but I thought they're crazy so I put the speedbrake out just prior to touchdown, landed, pulled the throttle to idle, pulled up the flaps, held the nose up, saw the 6000-foot mark and shut the throttle off. The aircraft began to slow down. I was going so slow I didn't need to brake. I thought I had to clear the runway so I rolled off and stopped. I was almost at a dead stop now and clear of the duty runway. Very, very little brake was needed. I was moving much slower than I can walk. I now began to shake all over and decided to relax on the oxygen so I turned it on and began sucking on the regulator. The crash crew was there and climbed up to me. The corpsman said to keep breathing the oxygen. I wasn't nervous nor did I feel as though I had been in any trouble. I thought I had done everything perfectly and had made a good approach and landing. Somebody took my mask and I went with the flight surgeon to the hospital. I felt okay but had trouble remembering exactly when each thing had occurred . . . I could reason but now I question if I did what I reasoned I should do.

According to the Flight Hazard Report, the pilot's oxygen mask and regulator were not connected securely. He did not check the connection before flight.

Hypoxia

In hypoxia, intellectual impairment is an early sign and makes it impossible for the individual to comprehend his own disability. Thinking is slow and calculations of a navigator or bombardier are unreliable. Memory is faulty, particularly for events in the immediate past. Judgment is poor. Reaction time is delayed. There may be a release of basic personality traits and emotions as with alcoholic intoxication. There may be euphoria, elation, pugnaciousness, overconfidence or moroseness. Muscular coordination is decreased and delicate or fine muscular movements may be impossible. This results in stammering, illegible handwriting, and poor coordination in aerobatics and in formation flying.—*AF Flight Surgeon's Manual.*

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OXYGEN: It Will and It Won't

Although the use of oxygen is a routine procedure for aircrews, there are several misconceptions about what benefits may be derived from its use.

THE fundamental purpose for using oxygen is to prevent hypoxia. This is accomplished by use of the familiar oxygen mask and regulator connected to a refillable oxygen container either liquid or gaseous. When given proper care this system has demonstrated its ability to prevent hypoxia. All this is well known.

Over the years other benefits have been attributed to breathing 100 percent oxygen. These include but are not limited to: improving vision, relieving the symptoms of bends, increasing mental alertness, and removing toxic materials from the body. The fact is 100 percent oxygen has no special advantage in doing these things.

The supposed benefits to vision were probably from the fact that a lack of oxygen will cause visual disturbance. Although this is true the converse is not, for if the lungs are receiving atmospheric oxygen under enough pressure to prevent hypoxia, adding more oxygen to the inspired air will not deliver more usable oxygen to the eyes.

What then does breathing 100 percent oxygen do? If breathed for several hours it will replace the other gases, mostly nitrogen, which are normally stored in the body. It is from this that the erroneous impression grew that oxygen will relieve symptoms of bends. The facts are that prebreathing 100 percent oxygen before exposure to low barometric pressure can be done to prevent bends. The theory is that replacing the nitrogen stored in the body with oxygen will prevent nitrogen bubble formation at high altitude. This seems to work. However, this same trick will not work once bends have developed. The reason is that, once the symptoms of bends are present, the bubbles have already formed (nitrogen has come out of solution). Another reason is that it takes a long time to replace nitrogen with oxygen.

There is only one way to relieve the symptoms of bends and that is by increasing the atmospheric pressure. During flight this almost always means descending to a lower altitude. Anyone who tries to relieve bends by switching to 100 percent oxygen just doesn't understand the problem.

The third misconception is that oxygen will increase mental alertness. This is not true for the same reasons oxygen won't improve vision. So long as a person is not hypoxic, his brain is receiving all the oxygen it can use. Saturating the blood won't improve mental functions one bit.

My final point concerning the benefits of oxygen concerns its ability to eliminate toxic substances. Contrary to popular opinion, there is no reason to believe that supplying pure oxygen will enhance the elimination of toxic materials from the body. Those who report beneficial results in treatment of such things as hangovers are practicing psychosomatic therapy.

In summary, to prevent hypoxia when the cabin pressure is reduced to an equivalent altitude of 10,000 feet or above, supplemental oxygen is needed. As the pressure goes down, the required concentration of oxygen increases. Your oxygen regulator does this for you automatically. 100 percent oxygen should not be expected to improve visual acuity or relieve the symptoms of bends.

Sufficient oxygen will prevent hypoxia. 100 percent oxygen will do nothing more.

by Major Samuel E. Neely, USAF

LUCKY LUCKY

THE pilot of an F3H-2 experienced a flameout in the traffic pattern at NAS Alameda. As attempts at corrective measures failed, he concentrated on ditching. The aircraft struck the water in a slightly nose-high attitude and rapidly came to a stop. The pilot then opened his seat belt and shoulder harness. At this time the cockpit was filled with water up to the pilot's hips. He removed his helmet, unfastened the parachute harness and climbed out just as the plane was sinking.

The lanyard from his life vest was still fastened to the life raft in the seat. He could not undo the catch. As the aircraft sank he was pulled under water. He drew his knife from its sheath

on his right calf but "for some reason decided not to cut the lanyard" and put the knife back. By this time the sinking aircraft had pulled him well under water. Unable to hold his breath any longer, he began to inhale water. He succeeded in removing his life vest, lost consciousness, and slowly floated to the surface.

A liberty boat from a carrier was in the vicinity when the aircraft ditched and proceeded to the scene at maximum speed. The pilot was not visible when the boat arrived and a slow circle was started. Very shortly thereafter, the pilot floated to the surface and two men from the boat went over the side to his assistance. They supported him in the water until the crash boat arrived., (No attempt was made to pull the unconscious pilot into the liberty boat because of the high gunwale and for fear of aggravating any injuries. As it turned out, he was uninjured and recovered from the effects of his submersion in six days.)

The first endorser on the AAR points out that the pilot's escape procedures were contrary to squadron doctrine. He removed his parachute before leaving the aircraft without unsnapping the lanyard connecting the life raft to the mae west. Standard procedure in his squadron is to vacate the cockpit with the parachute on.

The second endorser on the AAR comments on the seriousness of the pilot's decision to remove his crash helmet and mask prior to evacuation of the aircraft. "All pilots should be reminded that the use of 100 percent oxygen during all ditchings can be a life saver. No attempt should be made to unplug the oxygen connection prior to complete separation from all parts of the seat and aircraft. If evacuation is accomplished in accordance with squadron doctrine with parachute the pilot has an added chance for survival in the utilization of his bailout oxygen bottle."

Position to Eject

ON THE fourth approach in a series of touch-and-go landings, the starboard landing gear of the F11F collapsed. The student applied full military power and the aircraft became airborne. The damaged gear dropped from the aircraft at the upwind end of the runway. After inspection by his instructor-wingman and discussion with the squadron's base radio, the pilot was advised to eject rather than land with one gear down.

The pilot ejected at 6000 feet, landed in a plowed field and was picked up by helicopter. As a result of the ejection he sustained a compression fracture of one of his vertebrae.

The pilot, in his narrative of the accident, accounts for his back injury:

". . . I reached for the face curtain. I placed my feet in the buckets, pressed my back hard against the seat and pulled the curtain. The curtain seemed to hang up half way through its travel and I gave a forward motion of my head to aid in pulling the curtain. At this instant the seat fired and not being in position I suffered a back injury."

notes from your FLIGHT SURGEON

Helmet Saves

WHILE making practice MAD runs on a surfaced submarine, an S2F stalled in a turn and struck the water.

The copilot, still strapped in his seat, was thrown clear of the aircraft. His APH-5 hard hat with its tight nape strap and chinstrap saved his life. The impact was so great that, even with the tight straps, his helmet rotated forward, breaking the visor. He sustained only a slight skull fracture.

The crash was observed from the conning tower of the sub and the copilot and the other survivors were picked up immediately.

Potential Hazard

A STUDENT aviator on an MLP hop in an AD-6 flew into the water. The pilot opened the canopy manually, then exited the aircraft with parachute still strapped on. He surfaced, unbuckled his harness leg straps and inflated his life vest. After his life vest was inflated, he could not release his chest strap.

He was picked up immediately by helicopter.

Correct procedure in such a case is to release the chest strap before inflating the life vest or to get rid of the parachute completely. The student's inability to remove his parachute harness could have made helicopter pickup hazardous or even impossible.

Effective Training

All three men in this helicopter ditching were current in the swimming test required and in the Dilbert Dunker as well as emergency procedures for abandoning aircraft in a water crash. The effectiveness of the training was illustrated by the lack of difficulty in exiting from the aircraft and swimming to shore.—*From an MOR*

Descent Difficulties

AFTER experiencing repeated compressor stalls in an F8U-2, the pilot ejected successfully 16 miles from the carrier at 9500 feet. His bailout oxygen bottle functioned properly and he retained his APH-5 helmet and A-13A oxygen mask. During the descent, he found that his helmet restricted his head movements between the NB parachute risers so he discarded both helmet and mask.

As the pilot went through the normal descent procedure (i.e., pulling the pararaft container release D-ring and hooking the pararaft lanyard snap to his torso harness) his raft and sea anchor fell loose. The uninflated raft wrapped around his feet and the sea anchor inflated, ascended and entangled in the parachute shroud lines. The pilot removed the raft from his legs and disentangled the sea anchor from the shrouds. He then held the raft and sea anchor under his right arm.

At about 500 feet above the water, he let go of his raft and sea anchor and grasped his rocket-jet canopy release fittings. On entering the water, he was able to release the left fitting, but not the right one. (During the descent, he had correctly pulled his parachute manual ripcord handle after his parachute opened automatically. If this had *not* been done, the pilot would still have been attached to the canopy by the manual ripcord handle and the ripcord cable housing clip.) He tried to release the right rocket jet fitting several times but without success.

He managed to spill some air from his parachute by pulling with both hands on the lower riser, but when he took one hand from the riser he could not hold it long enough to keep the tension off the riser and release the hung canopy release fitting. He was dragged "a considerable distance" by the still inflated parachute.

"By guiding myself with the risers I was able to ride along with the parachute quite easily without being submerged," he stated later. "Finally I got out my survival knife which was strapped to my torso harness chest strap. (I don't think I could have gotten it from my leg.) I cut the remaining riser. From this point all went well."

The pilot inflated his life jacket, then inflated his life raft and climbed aboard. He put out dyemarker and when a rescue helicopter appeared, he set off a day smoke signal. The helo hovered downwind. He left his life raft and was easily hoisted aboard with the helicopter rescue seat, uninjured.

Years Ago

The pilot of an F3H-2 ejected over water. He was picked up some time later by helicopter. Reporting on the accident, the flight surgeon states that although this pilot had 3200 flight hours, 2200 of them in jets, his last water survival training was during his flight training in *1949!*

The anti-g-suit ...a must!

ONE of the greatest developments in World War II for the protection of a pilot in a dogfight was the anti-g-suit, now regularly worn in jet aircraft.

Without the anti-g-suit, the average pilot can withstand 4.5 to 5.5 g without losing vision or blacking out. With anti-g equipment, the average pilot is capable of withstanding 6.0 to 7.0 g. This protection is available only for sustained accelerations of 4-5 seconds or longer in maneuvers other than snap maneuvers. Anti-g equipment does not offer protection in snap maneuvers where 10-12 g can be applied in approximately one second. Snap maneuvers tend to prevent the physiological symptoms due to accelerative forces but introduce the hazard of overstressing the aircraft.

Before the introduction of the anti-g suit, pilots were temporarily able to raise their g tolerance 1 or 2 g or more by placing themselves in a forward crouch position and straining for all they were worth. This maneuver afforded a good measure of protection and was effective for about 10 to 15-second periods but was difficult to maintain in longer accelerations because of the effort it takes. You get tired, and the least relaxation in the work while you are pulling g will allow the blood pressure to fall and you are in danger of blacking out. Besides, with the type and amount of gear being worn in today's cockpits, not to speak of cockpit structure itself in today's Mach 1+ birds, it would be extremely inconvenient to bend over the controls and take your eyes off the panel in say, an over-the-shoulder maneuver.

The effect of the anti-g-suit is to prevent the pooling of blood below the heart level, to drive blood up into the chest, to raise the diaphragm so the distance between heart and eyes is shortened and, most important, to increase the pressure at which blood is pumped from the heart to the brain. Another feature, available with the anti-g-valve (but not with the earlier pressure regulating valve) is the push button at the top. By depressing this button you can inflate the bladders from time to time in long flights to relieve venous congestion of the legs and stiffness and tension of the body by a massaging effect. The push button also permits testing of the anti-g-equipment on the ground or in level flight.

The anti-g-suit comes in two types: the Z-3 cutaway suit and the Z-2 full-garment coveralls. BACSEB 23-57 recommends the following combinations:

(1) Summer weight flight suit (flame retardent treated) over the full-coveralls, or the full-garment coveralls over the waffle weave underwear.

(2) Cutaway anti-g-suit over the summer flight suit (flame retardent treated).

It is imperative that all pilots of aircraft in which anti-g-equipment is installed utilize this equipment and become familiar with its functions and benefits. *The effectiveness of anti-g-equipment in reducing fatigue under sub-blackout accelerations and especially so at high altitudes, where factors of mild anoxia, lowered pressures, and acceleration may be cumulative, cannot be overemphasized.* While high acceleration may not be encountered at high altitudes, anti-g-equipment is still of considerable value for its anti-fatigue characteristics.

The number of accidents in Fiscal 1960 where it was reported that the anti-g equipment was not used is appalling. No one knows the number of accidents where the lack of anti-g-equipment may have been a contributing factor.

Therefore, to improve combat preparedness and efficiency, all pilots concerned should be thoroughly indoctrinated and experienced in the use of anti-g-equipment. Before, where the pilot was in danger of graying or blacking out within several seconds at 4 g, he can now withstand 5 to 7 g, still perform efficiently, and bring the bird back.

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SECOND EJECTION

ON COMPLETION of a routine photo mission from the carrier, the pilot of the F8U-1P started back to the ship. He had plenty of fuel aboard so he decided to shoot some pictures of the plane guard destroyers. As he descended, he observed an aircraft which seemed to be setting up for a gunnery run on him. Adding power, he started a sharp turn to port and watched the stranger proceed on his way. He rolled his wings level and continued toward the destroyers at 5000 feet. Shortly thereafter, there was a severe explosion.

As the tachometer unwound he attempted to broadcast a Mayday but had no side-tone. He then deployed the ram air turbine and turned the emergency generator switch ON. There was no indication that it was operating. Once again he tried to transmit a Mayday but there was still no side-tone.

The altitude was 6000 feet. The pilot again checked the engine instruments and noted that the tachometer had stopped at 65% and was not decreasing further. The absence of engine noise and the rapid deceleration of the aircraft led him to the conclusion that the engine was frozen. Even if this were not the case, a relight was impossible with no power available.

As the aircraft slowed to 280 knots at 6000 feet, the pilot pulled the face curtain.

"All ejection gear functioned automatically," the pilot states in his narrative of the accident. "It seemed that seat separation might have been slower than the previous time I ejected and the chute opening shock was more severe but still I wouldn't call it violent.

"I watched the aircraft continue its descent in a slight nose-down attitude and the starboard wing slowly dropped. The aircraft changed heading 90 degrees to the right before crashing within five miles of the starboard quarter of the carrier. As I descended, I fired two .38 caliber tracers in an attempt to attract the attention of the destroyers which were between the carrier and myself.

"During the descent I pulled the D-ring free of the riser and threw it over my shoulder. I also released the left lower rocket jet fitting. I did not attach the pararaft lanyard at this time. As my feet touched the water, I attempted to release the other rocket jet fittings. The right one did not release readily and I was dragged by the parachute for approximately 10 feet. I was tangled in the shroudlines but was able to free myself easily. After actuating the Mk-3C life vest, I then inflated the pararaft and crawled in. The survival gear was all tied together and also tied to the raft.

"I could see the mast tops of the destroyers as I ignited a day smoke signal and also used the mirror. I used two of the day smoke signals; the third one turned out to be a dud. I was in the raft for approximately 30 minutes before the destroyers pulled alongside. Shortly after I boarded the destroyer via the ship's ladder the helicopter arrived alongside for the transfer back to the carrier."

The Aircraft Accident Investigation Board had a number of comments on this accident:

- The pilot made no attempt to retrieve his parachute after boarding the raft as he anticipated an early rescue. However since rescue is never a sure thing, an attempt should be made to retain the parachute as it can be of great value at a later time.
- The value of .38 caliber tracer ammunition in daylight is doubtful. Unless no other means of signaling is available, the tracer ammunition should be saved for darkness. It is also recommended that the revolver be attached to the holster by a lanyard. Removing the revolver from the holster while descending in the parachute or when in cold water could easily result in losing this valuable signaling device. The Board does not recommend removing the revolver from the holster while descending in the parachute.
- Sharp pointed objects should not be carried in flight suit pockets. The pilot carried a small screwdriver and one section of his PSK-2 survival kit in the lower left front pocket and the other section of the PSK-2 in the adjacent right pocket of his flight suit. On ejection, the contents of the left pocket ripped loose while the contents of the right-hand pocket were retained.
- The signal flares were reported to have been "very valuable" in directing the surface ship to the survivor. They were seen at a distance of 7 miles. However, the comment was made that the smoke dissipated very rapidly in spite of slight wind conditions.
- The flashing mirror was seen at a distance of 4 to 5 miles and was very valuable in directing the ship to the pilot.

RAFT OF TROUBLE

WITH pilot, copilot and two crewmen aboard, the HSS-1 launched in mid-afternoon as part of a four-plane ASW barrier flight. The sea state was moderately high; air temperature 78°. After establishing a hover at 40 feet, the pilot called the helicopter in the station south of him to cross-check his navigation. Immediately after this transmission the engine cut out and came back in. The pilot called a "Mayday" and side number and stated he had no tacan. He called the sonarman and told him to raise the ball and stand by to go in. The copilot placed the IFF in emergency and again alerted the crew to stand by to ditch.

After cutting in and out about 8 or 9 times with the cutouts becoming progressively longer, the engine quit completely and the pilot transmitted that he was going in. The helicopter settled in level at about 8 to 10 knots from about 20 to 25 feet of altitude and rotated to the left.

Water was in the cockpit as the men unbuckled to escape. The pilot tried to get out the right side but the cockpit hatch had closed on impact. He first tried to shove the hatch out with his shoulder but when it wouldn't give, he pulled the emergency release and it fell off. He climbed out, stood on the side of the aircraft and looked to see if the copilot was coming out. When he tried to inflate his life vest, he had trouble finding the toggles.

The copilot had unbuckled his safety belt as the aircraft was rolling over. Grabbing his raft, he pulled it out of the seat as he started for the starboard hatch. He tried unsuccesfully to get the pyrokit. By this time the helicopter was over on its port side and full of water. The copilot could not free the raft. When the water was over his head, he let go of the raft and surfaced free of the rolling aircraft. He inflated his life vest and looked around for the pilot.

"Grab the raft and inflate it," he heard the pilot yell.

He looked around and saw a raft behind him—most likely the same one he had tried to pull from the aircraft. He inflated it.

On sighting the two crewmen, the pilot shouted to them to stay together and he and the copilot swam over to them, towing

The HSS-1 settled in level at 8 to 10 knots from 20 to 25 feet of altitude.

the raft. The two crewmen had escaped through the starboard hatch of the sinking aircraft. They had stepped on the side of the aircraft and dived into the water. Swimming 25 feet from the plane, they had inflated their life vests. About the time the pilot and copilot reached the crewmen the aircraft sank completely. The men used the raft to hang on to; no one got in it. The copilot had considerable difficulty when his feet tangled in the sea anchor line. Meanwhile, the crewmen put several packets of dye marker out.

Two and one-half packages of dye marker were released by the survivors but due to the sea state and low altitude of the approaching rescue helicopters (200 feet) the dye was not seen by them. The AD aircraft spotted the dye marker from 500 feet.—AAR

As the men hung on to the PK-2 raft one of the crewmen tried unsuccessfully to inflate his PR-2 life raft. When it wouldn't inflate, he threw it into the PK-2.

This crewman evacuated the aircraft with the PR-2 raft attached to his thigh. However, he was unable to pull the zipper slide off the end of the zipper to inflate the raft. Normally, the slide rests on metal extensions at the end of the zipper and is held there by a small wire spring clip. Pulling the slide off the zipper extensions away from the zipper activates the inflation toggle. Many rafts have been found with the slide on the zipper just short of the zipper extension. Considerable manipulation is required to get the slide onto the extensions in its normal position. Pulling on the slide will not do this and thus the slide cannot be pulled free to inflate the raft. It is believed that this is what occurred in this case.—AAR

The other crewman did not have his PR-2. He had taken the raft off after takeoff and left the aircraft without it because "the raft snap was broken and wouldn't stay on."

This crewman was not wearing his PR-2 raft because the spring metal retainers on the strap snaps were broken and he felt the raft would not stay strapped to him. He did not carry the raft out of the aircraft. These spring metal retainers are missing from many of the PR-2 rafts in this squadron even though the rafts have been in use for only a few months at this writing. It is believed that the snaps are being broken by improper wearing of the raft. The designed method of wear is to have the raft under the arm on the right side of the body, with one strap over the left shoulder and the other strap around the waist. As a matter of comfort and minimum interference, the crewmen have been wearing the rafts on the side of the thigh with one strap around the waist and the other wrapped around the thigh twice.—AAR

At this time the survivors heard a helicopter approaching. The crewmen tried to ignite three signal flares but, although properly triggered, they would not fire. The copilot managed to get one of his day flares off just as the helo was passing west of them. After the flare burned out, he tried to signal with his mirror as the sun came out from behind a cloud. At this point, the helo turned back toward them and the pilot set off a night flare. Two other helos appeared on the scene.

One of the crewmen was picked up first. A second helicopter moved in to pick up the second crewman but had great difficulty remaining in position for him to get into the sling. For more than five minutes, the crewman later reported, he "was swallowing water from rotor wash and swells." His helmet "became very uncomfortable" and he pulled it off.

Discarding a helmet before a rescue is completed is not recommended. The helmet will protect the survivor against possible injury if he strikes the side of the helicopter during hoist.

As the crewman tried to swim for the sling, it moved again. Finally this helicopter moved away and a third came and made the pick-up. The copilot and the pilot were then picked up and all four survivors were returned uninjured to the ship. The pilot, the last man to be picked up, had been in the water some 20 minutes.

The copilot did not have his eyeshield down on impact with the water but pulled it down when the waves splashed in his eyes. This materially aided his vision while he awaited pickup.—MOR

After the accident a review of the survivors' water survival training and techniques disclosed that:

- The pilot had made a habit of going over ditching procedures frequently with the copilot while flying. He had performed ditching drills a week before the accident and was current in Dilbert Dunker and swimming. He had practiced being picked up in a helicopter sling.
- Earlier in the year, the copilot had had swimming training and a swimming test as well as helicopter hoist training. He had had Dilbert Dunker training two years previous.
- The first crewman was current in survival lectures, drills, swimming tests, Dilbert Dunker and helicopter hoist drills.
- The second crewman had had swimming training and frequent ditching drills but had never been through the Dilbert Dunker.


ENGINE LIFE DEPENDS ON CLEAN
OIL AND CLEAN OIL SYSTEMS!
Don't Neglect the
Oil Supply System

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OF COURSE, the prime consideration is the oil supply—no oil, no lubrication. Servicing of the oil tanks is a little tricky and the best place to find out how, is in the HMI. A word of warning is in order here though. Many times the tanks are serviced and it's thought they are full when in reality they are not.

The Handbook specifies that the aircraft must be leveled laterally before servicing. This is to ensure full utilization of the maximum available space in the tank. If the tank is tilted, a portion of it will not be filled.

Also when servicing the cylindrical-type tank, it may look filled through the filler neck, but it may be capable of taking more oil. Oil should be added slowly until it flows from the scupper drain. If you have good records on oil consumption for each engine, a good estimate of how much oil a given tank should take can be made. This will also help you to know if a tank is fully serviced.

The internal-tank vent line can also cause a false oil level indication if it or its hanger is deteriorated. The line is a flexible hose and it may droop if deteriorated. As the tank is filled, oil covers the vent opening and then air trapped in the top of tank prevents capacity filling. Here is another good reason for keeping good records on oil consumption.

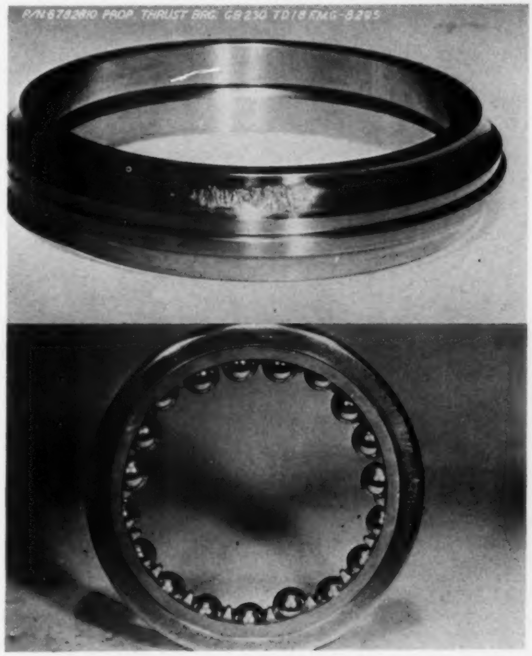
Damaged oil lines is another reason for lack of oil to an engine. Kinked or collapsed lines and age-deteriorated lines are the biggest culprits.

Lines may be kinked when they are installed, if they are improperly routed or if they are allowed to twist when tightening fittings. They may be kinked to such an extent as to reduce or completely block oil flow.

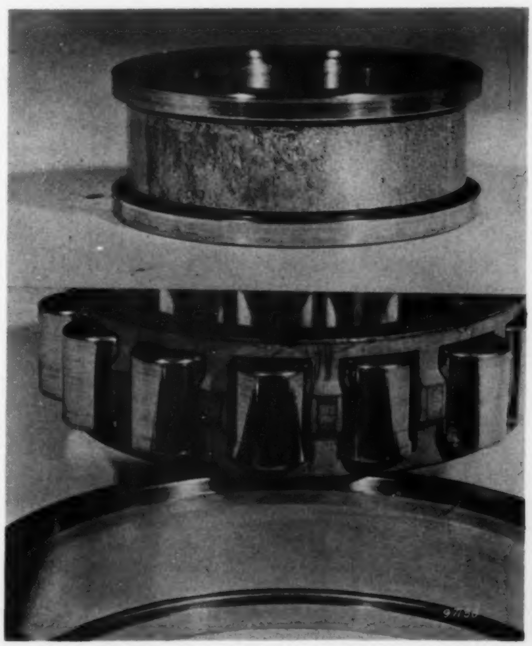
One way by which lines are collapsed is to close the oil shutoff valve prematurely. Standard procedure when shutting down an engine is to let it run at 70 percent speed for a couple of minutes. When the throttle is closed, the engine should be allowed to come to a full stop before closing the shutoff valve. Otherwise, the pumps will pull a vacuum which may cause the lines to pull together as a collapsed balloon will when you suck the rest of the air from it.

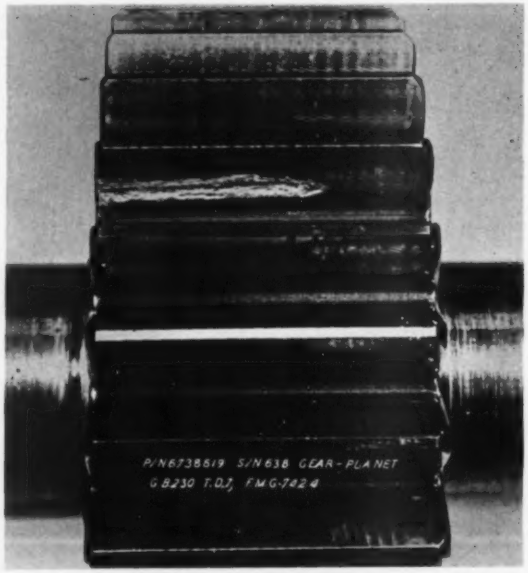
You can't do much about age-deteriorated lines except to be aware of age-control limits and replace the lines as required. Check the latest information on age control and replace any lines which are not within the age limits.

Damaged fittings and pump spline wear can cause lubrication problems too. Oil leaks at the fittings can cause valuable oil to be lost, while damaged pump splines can render the pumps inoperative. Proper spline lubrication procedures will do much to prevent damage in this area. Continued



Spalled bearings and races typical of those precipitated by oil contamination and/or lack of lubrication.





Gear failures are also precipitated by oil contamination and/or oil starvation.

Don't forget too that a malfunctioning aft frame ejector can cause oil loss. The ejector is used to provide a slight negative pressure within the aft frame to prevent oil flow through the seals. If this negative pressure is not maintained, oil may flow past the seals and be lost. Oil can be pulled through the ejector if the air pressure to it is too high.

Loose or lost oil tank caps can contribute to the cause too. Check the technical order for correct procedures for installing a cap and be sure it's in place when servicing is complete.

Lube system contamination is a never-ending cause of damaged bearings and gears. When you realize that lube jet openings are only a few thousandths of an inch, it's not surprising that a little foreign material can do lots of damage.

Contamination can be caused by internal failure of engine parts, by dirty oil and filters, by hose or system deterioration, and by poor shop or servicing practices.

When engine damage has occurred which might contaminate the system, flushing of the complete system is imperative. This requires removal of the tank and the shutoff valve from the aircraft and complete disassembly of the tank for cleaning and flushing. Aircraft lines and tanks are excellent places for contaminants to be deposited. There have been many cases where engines have been removed, no flushing was done, and at least one subsequent engine was damaged by the foreign materials in the system. Tanks should be flushed during every engine change regardless of the cause for the change.

If you are servicing with newly opened cans of oil, dirt in the oil should be no problem. Be sure the can is clean before it is taken near a filler neck, however, and exercise care that nothing is dropped into the tank while the cap is off.

Filters are supposed to get dirty, but too much dirt can cause trouble. Most filters are of the bypassing type. If the element becomes clogged, oil flows around it and the filtering feature is lost.

If O-rings or hoses are deteriorated to the point of break-up, pieces can easily get into the system and clog the jets, thus the concern for age-control inspection.

Poor shop and servicing practices can be eliminated by using care in connection with the lube system. Use of approved caps, covers, and plugs on hoses, fittings, and accessories will help prevent getting dirt and foreign material into these parts. Exercising caution when filling the tanks will keep the dirt out at this source. Proper flushing when required will help to prevent recurring damage.

One other source of contamination has recently been brought to light. It appears that over long periods of time sludge and other deposits have accumulated in lube tanks. Normal flushing may not remove it all. Investigation is underway to determine the advisability of a one-time or periodic disassembly of the tanks for a thorough cleaning.

Oil pressure is your only means of determining if an engine is being adequately lubricated.

During an engine start, there should be a positive pressure indication. If it's cold, pressure will be higher than normal but will become normal as the oil warms.

At idle an indication of 1 to 3 psig should occur, while at 88 percent engine speed the gage should indicate 10 to 15 psig, and at 100 percent the pressure should be 13 to 19 psig. These are normal pressure ranges, not maximum and minimum limits. Abnormal changes in pressure may indicate lube system malfunction and should be carefully investigated immediately.

Unlubricated bearings won't last long. Know your lubrication system and how to troubleshoot. Service the tanks after every flight. Be sure they are full and you're not being fooled into thinking they are. Keep dirt away from the system and if it gets in, clean it out. Know the normal pressure indications so that abnormal indications are immediately apparent to you. If you do all these things, in-flight shutdown rates due to lack of lubrication can be greatly reduced.

—*Excerpts from GE*—JET SERVICE NEWS

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Quality Control Checkpoints

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1. Is a maintenance quality control unit established?
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3. Are the discrepancies noted by the quality control unit completely evaluated and recorded?
4. Do supervisory personnel properly release aircraft when its status changes?
5. Are pilot write-ups carried forward for long periods of time?
6. Are time change accessories programmed in advance of periodic inspections and are accessories being operated overdue for long periods of time?
7. Is the number of aircraft inspectors assigned adequate and is the experience level high enough to insure complete inspection coverage?
8. Is technical order distribution effectively controlled?
9. Are adequate fire guards and other necessary safeguards taken while starting aircraft engines?
10. Are ground auxiliary starting units placed at proper distances from aircraft to preclude ignition of fuel spillage?
11. Are parking aprons and taxiways kept free of maintenance equipment?
12. Are anti-personnel screens being utilized for run-up by maintenance personnel?
13. Are measures in evidence to prevent foreign matter from entering jet air intakes during ground operation?
14. Are contractor technicians and technical representatives used to the best advantage?
15. Is adequate follow-up action being taken on shops and hangar inspections?
16. Are maintenance facilities adequate to support the unit mission?

Product Improvement Section

1. Is the product improvement FUR/DIR program organized and operating to obtain the required results?
2. Are records kept to discover recurring unsatisfactory conditions?
3. Are adequate numbers of qualified personnel assigned to effectively operate the unit?

Squadron Supply

1. Are adequate numbers of qualified personnel assigned at all levels?
2. Is prompt action and necessary follow-up action taken on AOCP aircraft not fully equipped (ANFE) and time change items?
3. Are property records maintained in such a way as to reflect the status of authorized equipment?
4. Are back ordered requisitions followed up to base supply by the squadron supply at least every 30 days?
5. Are supply inspectors and maintenance inspectors who are authorized to determine the condition of property so designated on organizational orders?

Aircraft Fuel and Oil Servicing

1. Are the airmen qualified through adequate training?
2. Is proper supervision exercised?
3. Is fuel storage and dispensing equipment properly maintained and operated to prevent servicing of contaminated fuel to aircraft?
4. Are segregators cleaned and checked for proper ballasting as prescribed in applicable TO?
5. Are all strainers, micronic filters and nozzle screens cleaned and checked at least as frequently as prescribed by applicable directives?
6. Are static ground wires utilized on all tractors and trailers?
7. What is the mechanical condition and cleanliness of the trailer fuel-pumping equipment?
8. Are nozzle dust covers attached to nozzles and are they utilized?

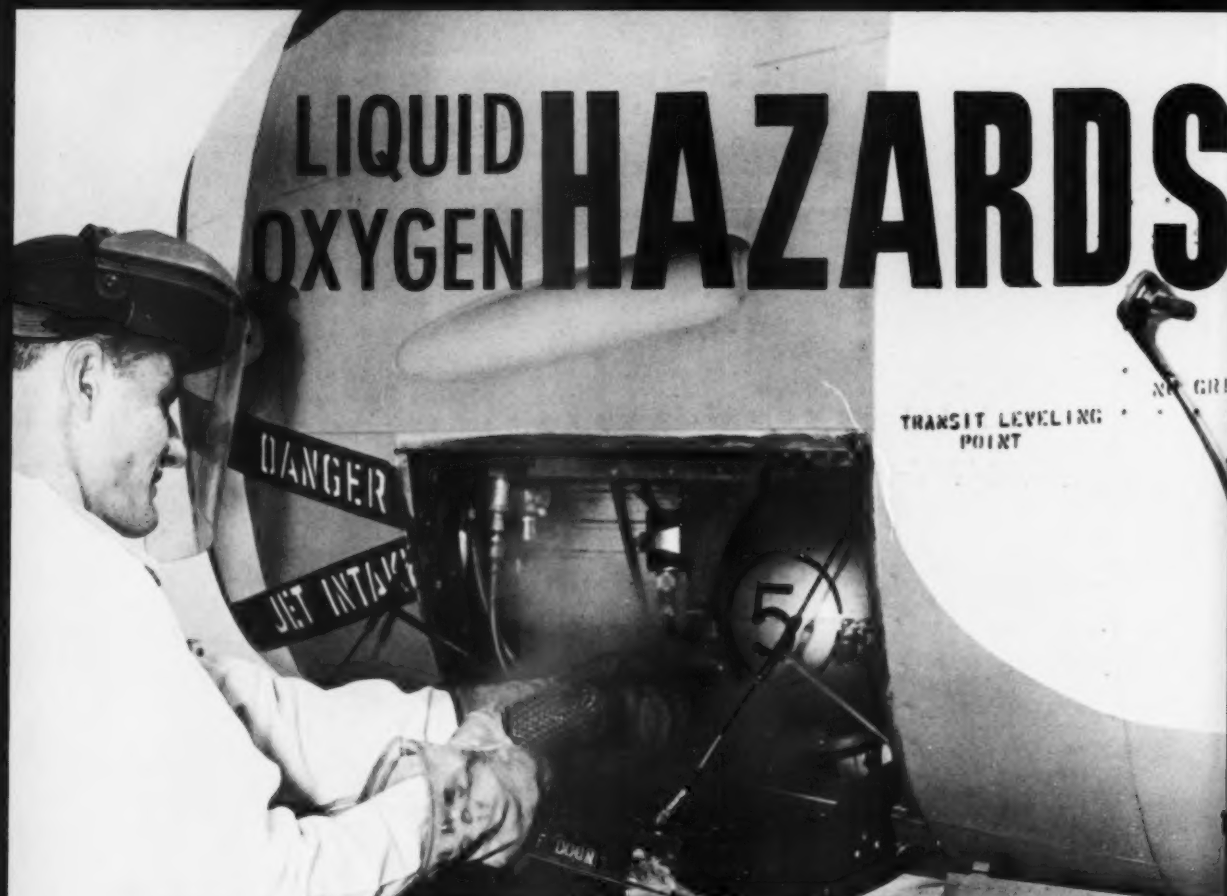
Ordnance

1. Is an adequate periodic inspection being performed on canopy jettison and seat catapults?
2. Is the loading and unloading procedures of ammunition, bombs, rockets, external stores, etc., completed with regard to position of aircraft, follow-up checks of equipment, supervisions, etc.?

Transient Service

1. Are transient aircraft properly and promptly serviced with fuel and oil?
2. Are both pressure demand and liquid oxygen systems servicing equipment properly maintained and utilized?
3. Are the auxiliary power units for both jet and conventional aircraft properly maintained and utilized?
4. Are the personnel properly trained as to the servicing of all models of aircraft?
5. Are sufficient numbers of personnel assigned to handle the average number of transient aircraft?
6. Are difficulties encountered referred through channels to the cognizant authority?

LIQUID OXYGEN HAZARDS



WE HAVEN'T had any reported mishaps with liquid oxygen in recent months, so it would be well at this time to bring to light a few items of great importance which may be overlooked. The greatest hazard with the current thinking is to let people get so familiar with liquid oxygen that they forget what a potential bomb they are dealing with. Spillage is considered by most operators to be just an every day occurrence and with evaporation the danger will have been dissipated. This sadly enough is not always the case.

Take for example a short film which was produced at NAS North Island. It dramatically depicted what could happen when JP and liquid oxygen were mixed and subjected to pressure in the form of a blow such as dropping a wrench or hammer into the solid frozen mixture. It blew up. Another portion of the film covered the instance where the handler allowed some spillage to evaporate on his clothing and penetrate the fibers. This was done by taking a dummy and pouring some of the liquid on his clothing and allowing it to evaporate. A simple spark was added such as you might get from lighting a cigaret or the spark from static electricity when clothing rubs together when walking. The dummy completely disintegrated in a mass of flames.

Let's take an actual example which turned out to have been a potential bomb. In this particular instance, the check valve failed to operate when the filler hose was disconnected upon completion of filling the converter. Some of the liquid went inside of the airframe and settled in the bilges mixing with the light film of fluid. The first action was to call the fire department. During the wait a mechanic went into the aircraft and opened all the hatches to dissipate the oxygen. They also decided to move the plane away from the vicinity of others on the line in case there was a fire. In accomplishing this a tow bar was required and a tractor was brought to the scene. Luck won out in this case and nothing happened. However, let's think objectively and realize what might have happened. Calling the fire-fighters was right. They are experienced in handling a situation such as this and would have prevented the mech from

Ashore, left, or aboard, above, always remember liquid oxygen is tricky,—exercise all safety precautions.

going into the aircraft. In doing so he had no protective clothing and the slightest spark from static electricity could have set off a tremendous fire. Also the firemen would have had all the other aircraft moved away rather than the one which contained all those oxygen fumes. This way the sparking steel tow bar and the tractor would have been eliminated. The situation would have been brought under control without endangering anyone. Remember, this liquid oxygen is tricky and if not properly handled can cause an accident.

Don't fall for the spectacular displays which some careless individuals can give to show that it is harmless. Insure that all safety precautions are strictly adhered to at all times and liquid oxygen can be the boon rather than the boom to Aviation Safety.—*ComNavAirPac*

Cleanliness A Must—*A few personnel have been observed working around liquid oxygen equipment while wearing greasy foul weather gear. The Supply Department has been directed to clean and waterproof this gear through facilities either on board or ashore. Department heads have been advised of the necessity for insuring that personnel concerned wear grease-free protective clothing.*

—USS INDEPENDENCE

Handling Liquid Oxygen

"CARELESS handling of liquid oxygen can result in severe skin burns and damage to valuable equipment. Liquid oxygen is cold (—297°F) and any heavy concentration of the liquid on flesh will cause a quick freeze or burn. Further, like gaseous oxygen, it will support combustion violently. Liquid oxygen accidents can be avoided by following simple precautions:

(1) Keep the body well protected by keeping sleeves and trouser legs rolled down, and by wearing a fairly heavy pair of gloves and goggles or a face shield.

(2) If working with a partner, know what each is doing at all times.

(3) Keep oils and other inflammable substances away from it.

(4) Keep the tank plumbing and transfer hoses free of dust by installing dust caps, plugs and covers when not in use.

(5) During transfer operations, it is possible for the clothing to become contaminated with rich oxygen vapors; therefore, personnel should not smoke until these vapors have dissipated."—***Customer Service Bulletin Memphis AFD***

NOTES AND COMMENTS ON MAINTENANCE

FUEL SYSTEM CONTAMINATION

It is readily accepted that proper operation of aircraft power plants, recip and jet alike, is dependent upon supplying a sufficient quantity of the right type of clean fuel to the engine. However, fuel system contamination continues to be assessed as the primary, contributing, or probable cause of numerous major aircraft accidents.

Fuel contamination may exist in the form of liquid, solid, or semi-solid materials. It may be sand, rocks, rubber, rust, water, alcohol, or you name it, at sometime or other it probably has found its way into an aircraft fuel system. Many safeguards have been provided to insure that the fuel delivered to the aircraft is free of any foreign matter. Similarly, aircraft fuel systems have been provided with screens, filtering devices, and sump drains to make certain that the fuel delivered to the power plant is of acceptable quality.

Although fuel is sometimes found to contain some foreign matter in the form of solids, micron filters and fine mesh screens in the aircraft fuel system will normally stop these objects before they enter the fuel control or the carburetor. Contamination of fuel with other liquids is much more difficult to detect and it is possible that mixing of the fuel with other fluids will cause engine failure. The presence of water in aircraft fuel systems compromises the safety of personnel and equipment and every effort must be made to insure that the fuel is water free. Water may be present in three different forms, dissolved, entrained, and free water. Since procedures are utilized to remove dissolved water prior to delivery to the aircraft tanks, and entrained water will eventually form into droplets and find its way to the bottom of the tank, the maintenance man is primarily con-

Refueling Procedures

As the result of a recent incident of putting the wrong fuel in an aircraft, namely Aviation Gasoline in a jet, the MCAF/MWSG-17 refueling orders have been revised in an attempt to prevent a recurrence. Five additional safety steps are incorporated, to wit:

1. Color Coding—A four-inch strip painted around fuel hoses adjacent to the nozzle and matching the color of fuel being dispensed. A four-inch strip, space limitation permitting, painted around fuel filler holes of the aircraft and matching the color of fuel used by that aircraft.

2. Type fuel certification chit to be signed by both the driver delivering the fuel and the person accepting for the aircraft, *prior* to actually accomplishing the refueling.

3. Physical separation of jet refuelers and aviation gasoline refuelers within the transportation refueler compound.

4. Refueler dispatchers personally check the assigned refueler as it leaves the compound to insure the right vehicle is making the run.

5. An aircraft/fuel used placard posted in Refueler Cabs.

It was recommended all units review refueling instructions and insure that same are carried out to the letter.

Further recommended posting of fuel color-coding chart in each line shack and emphasize the type of fuel used in its particular aircraft.—*2nd MAW*

cerned with the removal of free water. This can be done by draining of the fuel tank and filter sumps of the aircraft.

To assist in reducing the probability of aircraft accidents and incidents caused by fuel contamination, we offer the following suggestions:

1. Insure that the aircraft is serviced with the proper grade of fuel.

2. Make certain that the refueling nozzle and the area around the filler neck is free of dirt, snow, and water.

3. Do not service if the color of the fuel is different than that specified for the grade of fuel recommended and indicated on the side of the fuel servicing vehicle.

4. Do not use substitute fuel unless it is recommended in the Flight Manual.

5. Do not add alcohol to the aircraft fuel system except through alcohol systems.

6. If contamination is suspected, take fuel samples from each fuel tank and take necessary measures to have the aircraft grounded until a competent authority declares the system to be free of contamination.

7. If contamination is proven, notify maintenance officer and safety officer immediately.

8. Drain fuel tanks, filter cases and pumps. *Ed's note: Refer to BuWeps Inst. 10340.1 of 8 Dec. 1959 and major area commander's instructions; also to local command instructions for supplementary information as to when and how to take fuel samples. Use BuWeps Inst. 10340.3 of 9 Oct. 1959 for better fuel quality control.*

9. When you have finished servicing the aircraft replace and secure the fuel caps, unless you have received specific instructions to leave them loose.

Note: Remember that fuel samples must be taken when there is any doubt at all concerning the quality of fuel on board or being serviced into the aircraft. This applies especially if there is any indication of fuel filter icing or if the pilot reports engine malfunction which could be caused by fuel system trouble. Our chemical laboratory is equipped to make an immediate analysis of the drained fuel. This service is fast, it's free, and it's available—let's use it and be safe rather than sorry.—"Flying Safety Bulletin" USAF

Fuel samples sent in for analysis should be kept and shipped in clean cans, amber bottles or bottles covered with paper or some other cover which would prevent exposure of the sample to the direct rays of the sun. The direct rays of the sun acting upon AvGas will cause the lead to precipitate out and may cause a faulty analysis of the sample.

Continued

It Happened Here . . .

DURING a touch-and-go at an East Coast air station the other day a T-28 lost power after becoming airborne about 100 feet. The pilot crash-landed wheels-up some 200 feet off the end of the runway.

Investigation disclosed the aircraft along with 11 others had been refueled with—you guessed it—JP contaminated AvGas. The refueler, a 4500-gallon AvGas type had been inadvertently topped off with 2580 gallons of JP-4. Word to the pilots and commands was promptly sent out but seven T-28s managed to get airborne and safely land several hundred miles distant.

Fuel samples from the crashed T-28 disclosed AvGas contamination with approximately 60 percent JP-4!

It Happens Here, Too

The AF reports a T-29 (similar to R4Y Navy model) departed an east coast air patch and shortly after takeoff the right engine started running rough and showed a fast increase in cylinder head temperature. Power was reduced and the prop feathered. Just as the pilot got things cleaned up, the left engine started the same routine. Obviously he couldn't feather both, so he started up no. 2 again in an attempt to return to the base. This didn't work, however, as the right engine started to buck and vibrate so severely it had to be shut down once more and the ailing left mill wouldn't cut it. Seven miles short of the field the T-29 ceased to fly.

On investigation it was discovered that the aircraft had been serviced with JP-4. The truck used in servicing had multiple cells and was normally used as a JP tanker but because of equipment shortages has been serviced (in part) with 100/130 AvGas. Right here you can see trouble coming.

One day prior to the T-29 accident the truck received 800 gallons of gasoline and 3200 gallons of JP-4. Just to make things cozy, two C-54s were fed 800 and 1300 gallons respectively and . . . this was contaminated. Next the trailer was reserviced with 2100 gallons of 100/130 go-juice and the next move was to stuff a Gooney full of the blend. As luck would have it the T-29 happened to be the only machine to get off the ground and as noted, the flight terminated abruptly. Defueling and purging of the three sick birds was no small chore to say the least but far better than the scraping-up routine.

We've had instances of this sort for quite a number of years and it does seem as though they are completely unnecessary. Only last April a C-46 aborted a takeoff due to power loss on the part of both engines. Same reason. And last year three C-124s were put on a JP-4 diet . . . one got off and got back by virtue of having a sharp engineer who played musical chairs with his tank selectors and kept the four mills grinding. The other two birds couldn't complete the run-ups!

All of this leads us to one gimmick that you can use to prevent such mixups. It's not new . . . but it works. Just set up a system of locks and keys. Locks on the hydrants that may be opened only by keys chained to the correct trucks. Is this system foolproof? Of course not . . . but it will alleviate most of the mistakes. We still believe firmly that crew chiefs should personally check every fuel truck prior to accepting service. The MATS-types insist on this added safety precaution and it seems to pay off nicely.—*USAF Intercom*

Taped Vent

An A4D was prepared for a main wing cell fuel leak test. The vent system was sealed by using masking tape to cover the vent mast and securing the fuel cap on the top of the starboard wing. The fuel leaks were located by use of a vacuum pump which produced a negative pressure in the cell. The fuel cell was defueled and repairs were completed.

Following this the airplane was towed to the fuel pits for fueling after which it was to remain on the ramp and periodically be inspected for leaks. The plane captain connected the pressure fueling hose and instructed the civilian employee to commence fueling. An estimated two minutes later a loud explosion was heard and the pressure fueling pump was secured when fuel was detected pouring from the ruptured underside of the port wing. Damage to wing cell and the wing structure required the services of Overhaul and Repair.

An investigation of the cause of this accident was conducted and the following factors were revealed:

a. Fueling pressure and flow rate were normal at 14 psi/150 gpm.

b. The airplane's fuel system operated normally. All float valves and shut-off valves performed correctly during ground tests.

c. The main fuselage fuel tank was full prior to securing the refueling. A total of 318 gallons of fuel was pumped into the airplane prior to shutdown. Since the wing cell was empty and is capable of holding 573 gallons, the possibility of excess fuel pressure or quantity was dismissed.

d. *The masking tape had not been removed from the vent mast and the fuel cap was secured.*

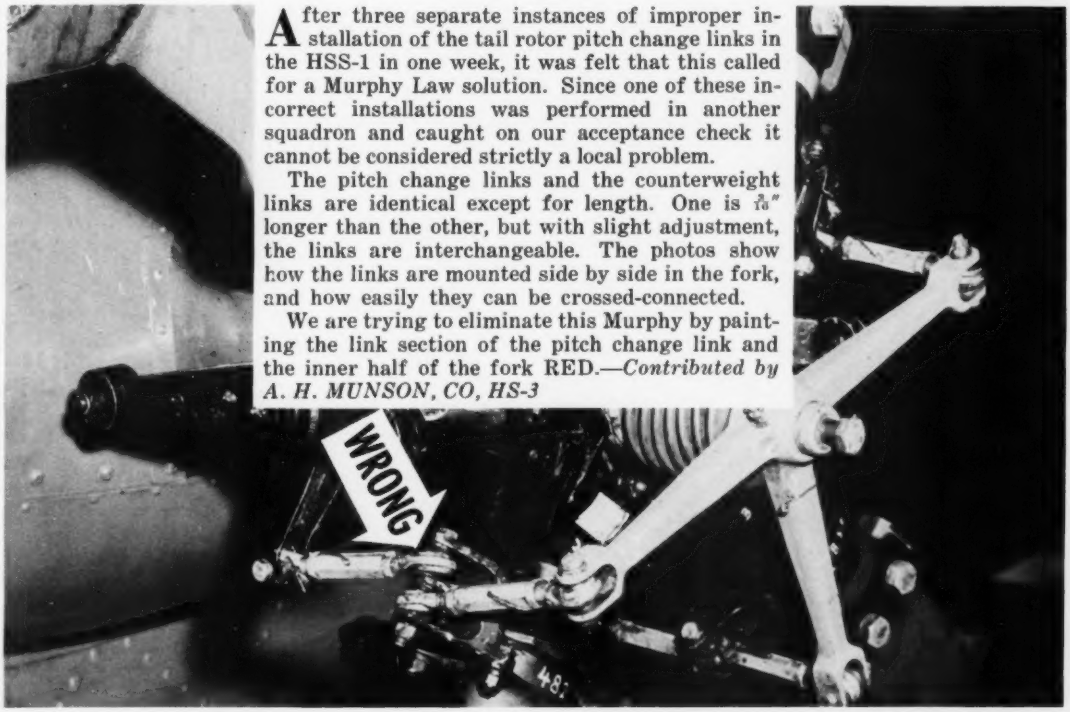
MURPHY'S LAW*

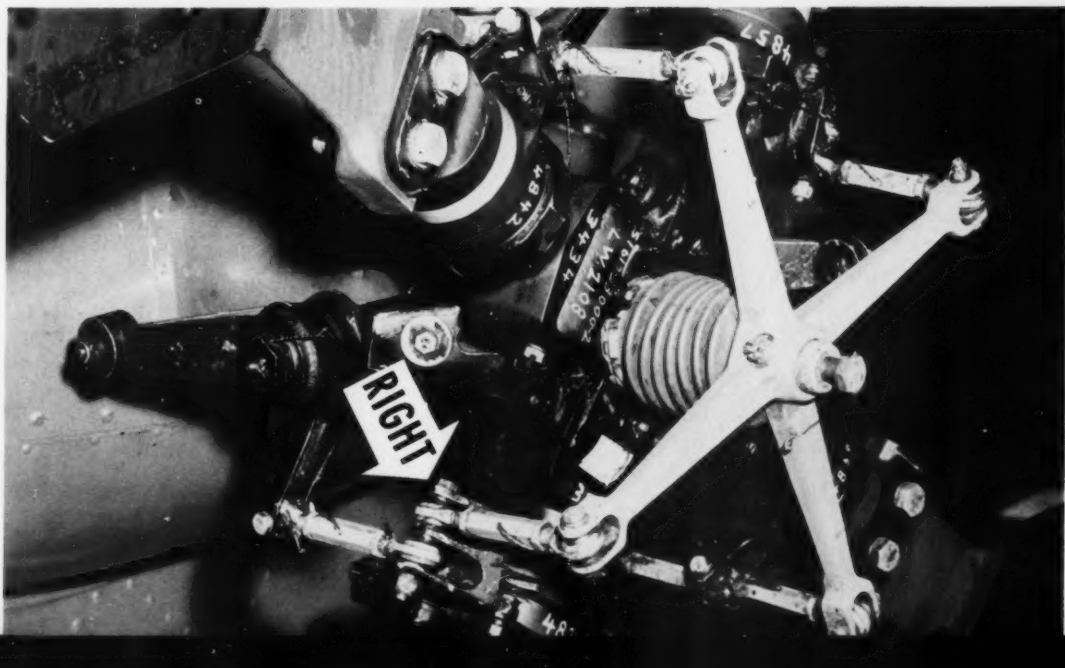
* If an aircraft part can be installed incorrectly, someone will install it that way!

After three separate instances of improper installation of the tail rotor pitch change links in the HSS-1 in one week, it was felt that this called for a Murphy Law solution. Since one of these incorrect installations was performed in another squadron and caught on our acceptance check it cannot be considered strictly a local problem.

The pitch change links and the counterweight links are identical except for length. One is $\frac{3}{16}$" longer than the other, but with slight adjustment, the links are interchangeable. The photos show how the links are mounted side by side in the fork, and how easily they can be crossed-connected.

We are trying to eliminate this Murphy by painting the link section of the pitch change link and the inner half of the fork RED.—*Contributed by A. H. MUNSON, CO, HS-3*





CLIPBOARD

Instrument Cross-Checking A Must

A CARDINAL principle of flying which recommends itself to frequent re-emphasis is the one concerning the technique of constantly cross-referencing all related instruments. This technique is applicable to most any phase of flight whether it be monitoring engines, navigation equipment, or flight instruments.

The validity of this technique has been proven time after time, and if a decision to act is made after analysis of the indications of all instruments, it will assist in averting a possible inappropriate or hasty response.

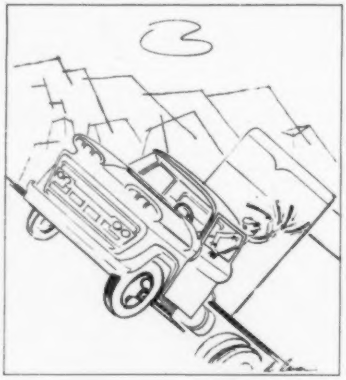
For example, the failure of an airspeed indicator due to ice in the pitot tube would probably materialize as a gradual but steady loss of airspeed. If, prior to reacting, the aircraft attitude and altitude was verified as being normal, it would then be readily apparent that an abrupt nose-down attitude would not be the proper course of action. With dual and separate instrument panels this decision could be instantaneously reinforced by glancing at the opposite airspeed indicator.

An oil pressure warning light can also be a potential cause for premature action if the red light should be used as the only basis for decision. Past experience, of course, has dictated "cross-checking" of all other related instruments—"oil-in" and "oil-out" temperature and tendency, oil quantity monitored for rapid loss, prop synchronization, and last but not least, the oil pressure gage itself should verify the reliability of the red light—before arriving at a decision to take corrective action.

—TWA Flite Facts

Strictly for the Birds

"We are indebted to Leyland Motors Limited for a story which may interest the exponents of man-powered flight. Apparently an enormous articulated truck and trailer was toiling up 'Pretty Sally,' a severe gradient on the Hume Highway between Sydney and Melbourne. Behind it were no less than 341 tooting cars, trucks and vans, but in spite of this the driver stopped his tractor three separate times, got out of the cab and beat on the tarpaulin with a stick.



"When one of his irritated followers asked him what the devil he thought he was doing, the answer was 'I gotta load here of 650,000 budgies. If I don't keep 'em flyin' I'll never get up the flaming 'hill.' "

Radar Vectors to Final Approach

INVESTIGATION of a recent accident indicates some Air Force pilots are accepting an air traffic control clearance to execute an instrument approach for which the pilot does not have a letdown chart in his possession. AFR 60-15 is very specific on this point. Para 39a states, in part: "The facility upon which the letdown procedure is based must be operational and the pilot must have a copy of the appropriate letdown in his possession."

Radar approaches are the exception to the above rule. There is a difference, however, between a radar approach to the runway (ASR/PAR) and a radar vector to a point on final approach from which the pilot is expected to provide his own navigation to the runway. In the first instance a pilot is not required to utilize a letdown chart. In the second instance the pilot must utilize the appropriate letdown for that part of the approach for which he provides his own navigation.

It is not uncommon for radar approach control facilities to vector aircraft by radar to a point on final approach and then clear the aircraft for a straight-in or circling approach, to contact the tower immediately. During final approach the pilot is not receiving radar guidance. If the pilot has accepted this type of air traffic service he should have in his possession a letdown chart depicting the final approach. Also, the chart must be compatible with the navigation equipment aboard the aircraft (Tacan, VOR, ILS, or ADF).

Pilots of jet type aircraft are reminded to be especially cautious in accepting radar vectors to final approach. The High Altitude Terminal Approach Charts may not contain the final approach for which the pilot has been cleared. (Ltr, Hqs USAF, Subject: Radar Vectors to Final Approach).—*"Eglin Sentry"*

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Hatches & Doors

Following the fashioning of the stone axe and the discovery of fire, prehistoric man reportedly hung an animal hide over the entrance of his cave to keep out the cold. That was the first door—it worked well. It was light, flexible, tough and easy to use. It swung both ways and always returned to the static position without latches, bolts, hinges, and warning lights, and it couldn't be slammed.

But our ancestors—not satisfied, decided to improve the "dour." They hung rocks on the bottom of the bearskin to make it more stable in the breeze—and then the trouble started. This was the first modification in the evolution of the door which not only has become more precisely adapted to our particular needs, but has also acquired built-in maintenance problems. There are some doors which seldom cause much trouble—like the jail cell variety we see in "Gun Smoke"—but such indestructible, simple masses of steel—anchored in solid masonry, have limited applicability because of their weight.

Airplane doors—though equally strong in their specific capacity to resist the stresses of speed and tons of differential pressure are as flimsy as feathers when assaulted with ground handling forces. These doors are loaded with mechanical ingenuity—excellent examples of man's civilizing accomplishments—but man himself frequently reverts back to the stone age and treats them like indestructible bear hides.

Doors and hatches are flung open and bounced against the stops—they jump their tracks and are then yanked and beaten in the derailed position during attempts to close them. They are used as steps and the hinges break. Baggage and cargo carts are slammed against them. Step stands and ladders take their toll and the sum of these abuses is comparable to the handiwork of a prehistoric creature wielding a marble mallet.

The operation of the doors is simple—but they are not inherently resistant to damage from being abusively used—*easy does it.* We can't be too cautious when maneuvering ground equipment in the area—when not sure of the clearance, holler for guidance—doublecheck—don't gamble—the odds are against the airplane—they seldom win in a bout with ground equipment.

Weather means different things to different people. Take the raindrop: For the pilot, rain means a blurred windshield and reduced braking action. The flight deck people think in terms of slippery parking and footing. The aerographer must note changing conditions for his sequence report.

Yes, weather means different things to different people, but in relation to flight operations it is a common enemy. Weather adds another critical element to the "chock to chock" concept of all-weather flight operations; it requires more attention and demands more effort to complete the mission safely.